

**COST REVIEW and ESTIMATE
(ICR-ICE)
STANDARD OPERATING PROCEDURES (SOP)**

**DEPARTMENT OF ENERGY (DOE)
OFFICE OF ENGINEERING AND CONSTRUCTION
MANAGEMENT (OECM)**

December 2011

Pre-Final

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EXECUTIVE SUMMARY

The Office of Engineering and Construction Management (OECM) conducts External Independent Reviews (EIRs), Independent Cost Reviews (ICRs), and Independent Cost Estimates (ICEs) as required by DOE Order 413.3B, *Project Management for the Acquisition of Capital Assets*, dated November 29, 2010. This Standard Operating Procedure (SOP) provides guidance for OECM staff and contractors performing ICEs and ICRs. A separate SOP provides guidance for EIRs.

Figure ES-1 lists the principal reviews required by DOE O 413.3B at various stages of a project.

Figure ES-1. Summary of OECM Reviews and Cost Estimates by Critical Decision⁴

Critical Decision	CD Stage	OECM Review	Applicability
CD-0	Approve Mission Need	Mission Need Statement Documentation Review/Recommendation	TPC≥\$100M
		ICR	MSP ¹
CD-1	Approve Alternative Selection and Cost Range	ICE or ICR ²	TPC≥\$100M
CD-2	Approve Performance Baseline	EIR with ICE	TPC≥\$100M
CD-3	Approve Start of Construction / Execution	EIR	MSP
		ICE ³	TPC≥\$100M
CD-4	Approve Start of Operations or Project Completion	none	

Notes: 1. Major System Project (MSP)—TPC≥\$750M or as designated by Secretarial Acquisition Executive (SAE)
2. As deemed appropriate by OECM. See SOP Appendix K for guidance.
3. If warranted by risk and performance indicators or as designated by SAE
4. Refer to DOE O 413.3B, Figures 1 and 2, Appendix A, for project life cycle and critical decisions. Section 3, Figure 1 of this SOP lists the reviews required at each critical decision in more detail.

Figures ES-2 and ES-3 depict the phased processes used to conduct ICRs and ICEs.

Figure ES-2. Simplified ICR Review Process and Timeline

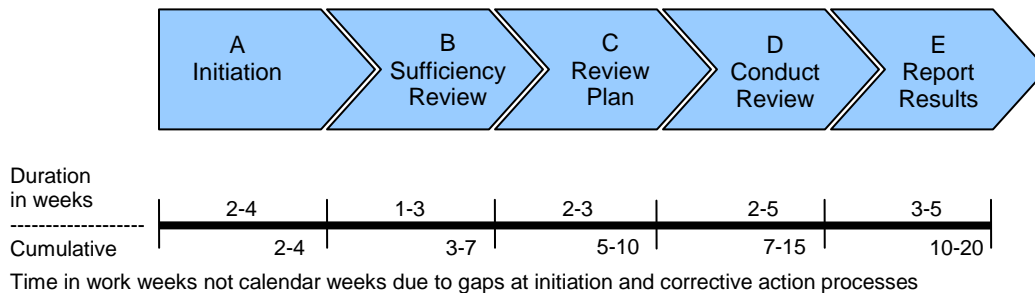
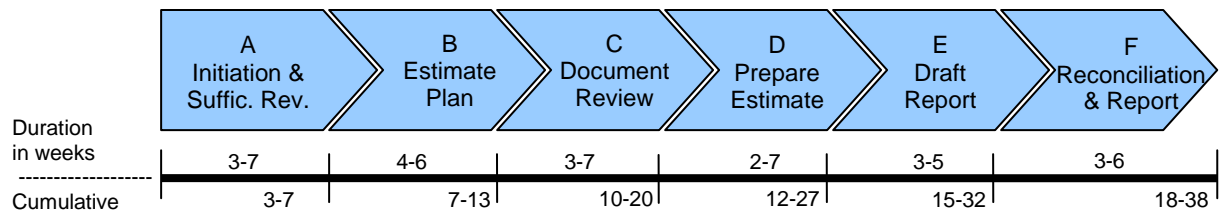


Figure ES-3. Simplified ICE Review Process and Timeline



While the processes are similar, there are fundamental differences in the ways that ICRs and ICEs are conducted. Section 3.5 provides further information on the processes and timelines for ICEs and ICRs. An ICR takes about 10–20 weeks, and an ICE takes approximately 18–38 weeks. The processes can, and generally will, be tailored to fit particular projects.

The timeline for an ICR is highly dependent upon the how responsive the project team is in providing supporting documentation early in the review, and on the quality of the preliminary estimate.

Corrective actions are not normally part of an ICE. There is, instead, a reconciliation process. Reconciliation identifies areas of significant difference between the ICE team and project team estimates, attempts to explain the reasons for those differences, and seeks consensus where differences are present. Notably, it is not necessary to achieve consensus, but it is essential to document and explain differences. This information provides a useful basis on which an Acquisition Executive can determine whether to approve a proposed cost range or baseline, or to seek further refinements prior to such approval.

Figure ES-4 provides a “roadmap” for using this SOP. The OECM project review lead should refer to this SOP, the EIR SOP, the Project Reviews Guide (G413.3-9), and the OECM body of knowledge (OECM project files – past review plans and reports) for

guidance in planning any OECM-led review. There are also a number of relevant templates on the Office of Management Project Management website: <http://energy.gov/management/office-management/operational-management/project-management/reviews-and-validations>

Figure ES-4. Cost Review/Estimate SOP Roadmap*

* Based on the phases outlined in Figures ES-2 and ES-3

Phase #	Phase	Activity	SOP Section	SOP Appendix/References
A	Initiation	Review Planning starts with budgeting and the planning cycle	2	
		Review kickoff – scoping meeting; roles and responsibilities	3.1; 3.3	
		If CD-1, determine if ICE or ICR	4.2, 5.3	A
		Review/Estimate process description	3.5.1 (ICR) 3.5.2 (ICE) 3.5.3 (EIR/ICE)	B (ICR) E (ICE) G (EIR/ICE)
		Review Team selection – staffing	3.2	
		If applicable, support contractor selection – prepare support contractor task order (SOW) – confer with OECM COR	3.2	
		Collect project documentation and distribute to review/estimate team. See applicable appendix for suggested list of documents required. Note: review team may have additional document requests.	3.4	C,D (ICR) F (ICE)
B	Sufficiency Review	Review/estimate team initial review of the project documentation for sufficiency	3.4.2	C,D (ICR) F (ICE)
C	Review Plan	Team prepares draft and final review plans (Estimate Plan or Review/Estimate Plan)	3.4.3	DOE G413.3-9, Appendix D
		Conduct periodic coordinating phone calls among OECM, Federal Project Director (and Project Manager),OECM Contractor Team lead	3.5	
D	Conduct	Perform Review-detailed	4.1—4.3 (ICR)	C,D (ICR)

Figure ES-4. Cost Review/Estimate SOP Roadmap*

* Based on the phases outlined in Figures ES-2 and ES-3

Phase #	Phase	Activity	SOP Section	SOP Appendix/References
	Review	document review; on-site review	5.2 (ICE)	F (ICE)
		Conduct Outbrief	3.5	
		Complete Document Review	3.5	
E	Report Results	Draft Report	4.4, 5.7	
		If ICE, prepare estimate; issue draft estimate report	5.7	DOE G 413.3-21
		ICR Final Report	4.4	
F	ICE Reconciliation	Reconcile estimate with project team; issue final estimate report (if combined EIR/ICE, estimate report may be addendum to EIR report or stand-alone report)	5.7; 5.8	
	All tasks	Follow-up Evaluation and Feedback; document lessons learned	6	

1. PURPOSE AND AUTHORITY

This Standard Operating Procedures (SOP) document provides guidance for Office of Engineering and Construction Management (OECM) staff and contractors performing Independent Cost Reviews (ICRs) and Independent Cost Estimates (ICEs), as required by DOE Order (O) 413.3B, *Project Management for the Acquisition of Capital Assets*.

Figure 1 lists DOE O 413.3B-required reviews, which include but are not limited to ICRs and ICEs.

**Figure 1. Project Review Requirements per DOE O 413.3B
(OECM Actions in RED BOLD)**

Type of Review	Project Phase				
	Pre-CD-0	Pre-CD-1	Pre-CD-2	Pre-CD-3	Pre-CD-4
EIR			TPC > \$100M or if no PMSO (OECM)	MSPs – (OECM)	
IPR		HAZCAT 1, 2, 3 Nuclear Facilities – integration of safety into design (PSO)	TPC < \$100M (PMSO)	Non-MSPs (AE waiver allowed) PMSO	
Other Reviews	Mission Validation Review for Major Systems Projects (PSO) Review Mission Need Statement Document/ provide Recommendation; projects with TPC > \$100K (OECM)	For MSPs, Acquisition Strategy Review (OECM)	PDRI for TPC > \$100M (Federal Project Director (FPD), review in EIR) TRA for MSPs (PSO) TIPR for HAZCAT 1, 2, 3 Nuc. Fac. (PSO)		ORR or RA for HAZCAT 1, 2, 3 Nuc. Facilities Readiness to Operate Assessment for other projects
Peer Review				Annual for TPC > \$100M (PSO)	Annual for TPC > \$100M (PSO)
ICR	For MSPs or as designated by SAE (OECM)	For Projects > \$100M (OECM) – or ICE (See Appendix K)			

**Figure 1. Project Review Requirements per DOE O 413.3B
(OECM Actions in RED BOLD)**

Type of Review	Project Phase				
	Pre-CD-0	Pre-CD-1	Pre-CD-2	Pre-CD-3	Pre-CD-4
ICE		For Projects >\$100M (OECM) or ICR (See Appendix K)	TPC > \$100M (OECM)	TPC > \$100M if warranted by risk and performance indicators or SAE directed (OECM)	

Notes:

1. IPRs and Peer Reviews are listed as they may be performed by OECM for programs without a PMSO or by request of the SAE/AE/Program Secretarial Officer (PSO).
2. DOE O 413.3B specifies that the Order requirements are applicable for all capital asset projects having a TPC greater than or equal to \$50M, unless project performance is not maintained within success targets. In that event, the Deputy Secretary (on a case basis) may change the threshold for applicability. PSOs may be exempted from the Order. (See O 413.3B, Sections 3a, Departmental Applicability, and 3.c (3) Exemption.)

Appendix A outlines a process for determining whether to perform an ICE or an ICR. Determining criteria include the phase of a project, its total project cost (TPC), and risk considerations. At CD-0 and CD-1, an ICR is generally performed to provide the Acquisition Executive (AE), Secretarial Acquisition Executive (SAE), other senior leaders, and Congress confidence that the cost and schedule estimates performed by the project team are reasonable and defensible. At CD-2, an ICE is required to support OECM's validation of a baseline. An OECM validation is an unbiased assessment that the project scope can be completed within the projected cost and schedule.

An ICR or an ICE may be performed as a separate evaluation, or it may be combined with an EIR. OECM has a separate SOP for EIRs. An OECM-led ICE performed at CD-2 may be initiated separately from the EIR as described in Section 3.5.2 and Appendix E, or performed simultaneously as described in Section 3.5.3 and Appendix G.

2. BUDGETING AND PLANNING CYCLE

ICR and ICE funding must be sufficient to ensure a useful and effective OECM review program. PARS II is considered the authoritative source of information on forecasting projects that require consideration in reviews program planning. Semi-annually by March 30th and September 30th, OECM will distribute an OECM ICR/ICE schedule to Program Offices, based upon CD-planned data in PARS II, for the current fiscal year, as well as a two-year projection. OECM project analysts will coordinate with the appropriate Programs to verify/update the schedule. The updated schedule will provide information for OECM's budget request and will enable OECM to plan its support contractor workload and resources. Cost reviews for projects less than \$100M will be funded by the Program requesting the review, unless the Program does not have an established PMSO. In addition, Programs will fund any emergent, unplanned reviews. Reviews conducted at CD-1 in support of alternative financing which were not included in the OECM Reviews planning schedule, will be funded by OECM, budget permitting. Otherwise, it will be the responsibility of the Program to fund. Figure 2, OECM Reviews Program Planning, provides further information.

Figure 2. OECM Cost Reviews Program Planning

Please Note: ICR and ICE requirements will be projected based on the forecasted CD-1, CD-2 and CD-3 approval dates and Total Project Costs (TPCs) indicated in the Project Assessment and Reporting System (PARS II). It is the responsibility of Programs to maintain accurate project information in PARS II.	
March (activities conducted yearly)	September (activities conducted yearly)
<ul style="list-style-type: none">- Confirm/Update EIRs, ICRs, ICEs to be executed during remainder of year based on PARSII extraction information (FY)- Confirm/Update EIRs, ICRs, ICEs to be executed during next fiscal year based on PARSII extraction information (FY+1)- Update OECM Reviews (EIR, ICR, ICE) Plan for budget under development based on PARSII extraction information (FY+2)	<ul style="list-style-type: none">- Confirm/Update EIRs, ICRs, ICEs to be executed during next fiscal year based on PARSII extraction information (FY+1)- Confirm/Update OECM Reviews (EIR, ICR, ICE) Plan for budget to be submitted to Office of Management and Budget based on PARSII extraction information (FY+2)- Define rough plan for OECM Reviews (EIRs, ICRs, ICEs) based on PARSII extraction information (FY+3)

OECM will plan, implement, and monitor contractual arrangements for all approved OECM cost review services.

It is incumbent upon OECM and the Programs to ensure that the OECM Cost Reviews projection listing is accurate so that resources can be planned for and secured in an efficient and timely manner. Periodic OECM Reviews planning meetings with each Program may be essential to this process.

3. OECM COST REVIEWS PROCESS OVERVIEW

Program should request an OECM Cost Review at least 8 weeks in advance of the start of the review on-site visit.

OECM is responsible for coordinating all activities with the review/estimate team. While an ICR or ICE process is a collaborative effort, decisions concerning all matters requiring resolution will reside with OECM.

The Programs should submit a request (e.g., e-mail or phone call) from the respective Project Management Support Office (PMSO) or Program Manager (if no PMSO exists) to OECM at least 8 weeks prior to the desired start of the review/estimate on-site visit. This advance notice is required to ensure that an appropriate review/estimate scope is developed (tailored) for the project and that resources, including funding and personnel with appropriate subject matter expertise are available to cover the review. Additional time above the minimum for notice to OECM is recommended.

Of equal importance, Programs should ensure that they are prepared to provide the substantial documentation that is required to support an ICR or ICE. Insufficient documentation is a major contributor to both schedule delays and less than optimum ICR/ICE results. Appendices F and J contain checklists of typical project documents for an ICR and ICE.

All ICR and ICE team documents, including the review/estimate plan, entrance and exit briefs, and the report are to be written as, viewed as, and communicated as OECM products. The name of the OECM support contractor selected to support the EIR should be identified in the documentation (e.g., Executive Report and team biographical sketches). The planning and report document covers only show OECM and the DOE logo.

ICR and ICE reports are OECM products.

Statement of Work Templates for use when obtaining contractor support for ICRs and ICEs are available on the Office of Management Project Management website: <http://energy.gov/management/office-management/operational-management/project-management/reviews-and-validations>

3.1 Scoping Meeting

Program and OEMCM representatives will conduct a Feds-only review scoping meeting to collaboratively define the scope, bounds, and objectives of the cost review to be conducted. The OEMCM Lead will chair the scoping meeting, and attendance should include appropriate Program and project office personnel including the designated FPD. If any core review elements are not to be addressed, the reasons should be identified in the scoping meeting notes.

A sample format for documenting the agreed upon scope of the ICR or ICE is provided on the Office of Management Project Management website: <http://energy.gov/management/office-management/operational-management/project-management/reviews-and-validations> Appendix A outlines the decision-making process for determining if an ICR or ICE will be conducted, and should be used by the OEMCM representative during the scoping meeting.

Readiness of the project documentation is a critical item in the planning; incomplete or late information will jeopardize the EIR/ICR/ICE schedules.

3.2 ICR/ICE Team Selection and Staffing

Based on the agreed-upon review scope, the scoping meeting attendees will outline the subject matter expertise and skills required of the ICR/ICE team members. Ideally, teams will include individuals with appropriate project management and cost engineering certifications (PE, CCE, CCC, PMP, etc.) as well as subject matter experts (SMEs) with knowledge of specific areas required to understand and analyze a particular project (e.g., any unique technical areas such as nuclear safety expertise, Hazard Category 1, 2, and 3 nuclear facilities or project execution strategies). The team size depends on the complexity and scope of the review/estimate, the project's risk and performance profiles, the schedule for completion, and the OEMCM ICR/ICE budget. The OEMCM Lead should ensure that all review areas or estimate areas are covered by qualified team members. In addition to any "core" ICR/ICE contractor members, the team should include Program representatives including Federal or contracted employees (to include lab and/or M&O contract employees).

Peer review members are an essential part of the ICR/ICE team.

This team approach allows for individuals with specific, relevant expertise to not only assist in meeting the review objectives, but also to add value to the project by propagating best practices and identifying improvement opportunities. The inclusion of Program representatives (peers) will also help provide a pool of talent for future "peer reviews". Having a core of qualified people who can "carry over" from one review to the next is essential to maintaining continuity over the course of a project. In this regard, the Program representatives should be people who will serve on future peer reviews. To fill special skill sets, the Program may also suggest individuals to augment the review team, as appropriate.

Upon completion of the scoping process, OECM will coordinate with the selected support contractor (if applicable) to ensure the contractor is aware of any special requirements or circumstances, and to clarify the scope and schedule of the upcoming review. To document that the team meets the desired qualifications, biographical sketches (Bios) for all team members actively participating on the team as reviewers—one page or less, per person—will be included as an appendix to the review/estimate plan and to the subsequent report. Bios are not required for observers.

Team members should include appropriate disciplines to conduct the review or perform the estimate, including schedule, management, safety, and technical SMEs, as well as cost and risk management analysts. All review/estimate team members are expected to provide independent input to the out-brief and to the review/estimate report while adhering to the schedule approved by OECM in the Review/Estimate Plan.

OECM staff will often be assisted by representatives of other DOE offices. To ensure independence, it is not appropriate for the project proponents (i.e., the DOE site office line management, the DOE program manager, or the DOE site project contractor) to participate as a member of an EIR, ICR, or ICE team. If the DOE Program Office staff desires to provide team members, none of the assigned staff members should be a project advocate. A Program Office project advocate may, however, participate as an Observer.

A support contractor normally helps OECM conduct reviews and estimates. The Office of Management Project Management website contains templates for obtaining contractor support for ICRs and ICEs: <http://energy.gov/management/office-management/operational-management/project-management/reviews-and-validations>

The support contractor will assist the OECM Lead in developing the Review/Estimate Plan, assigning areas of responsibility to team members (including peer review members), executing the review, developing the out-brief, and drafting the report.

OECM will approve the final review/estimate team membership via its approval of the Review/Estimate Plan.

3.3 Roles and Responsibilities

During the review process, roles and responsibilities should be clearly understood by all participants. In general, the following roles and responsibilities will apply:

Role	Responsibility
OECM Lead	Federal lead; facilitate the process; resolve issues; kick-off onsite entrance and exit briefs; input to and review/approve Plan and Report
Program/Project/FPD	Support review process with resources, time, data, and personnel; review report for factual accuracy
ICR or ICE Contractor Team Lead	Leads Contractor Team members and serves as Contractor POC
ICR or ICE Contractor (other active review participants)	ICR/ICE team members, perform assigned reviews, provide input to draft report; support Corrective Action Plan comment resolution (if applicable), recommend validation
ICR or ICE Peer Members	ICR/ICR team members, provide input to Review/Estimate Plan, perform assigned reviews, and provide input to out briefing, and draft report. Provide continuity and future follow-up.

While not always possible, every effort should be made to clarify and resolve differing opinions among ICR/ICE team members. The OECM Lead will facilitate resolution. The Support Contractor (or the OECM Lead if a Support Contractor is not used) is responsible for gathering inputs from all review team members and drafting the report. If differing opinions among the OECM team members cannot be resolved, the divergent perspectives will be documented in the draft and final report, under an appropriate section inserted to capture these divergent views. It is important to ensure that a complete picture of the evaluation is available in order to maintain the independence of the ICR or ICE.

3.4 Project Documentation, Sufficiency Review, and Review/Estimate Plan

3.4.1 Project Documentation

Once the ICR/ICE start date is confirmed and, if applicable, the support contractor has been authorized to support the review/estimate, the FPD must submit to OECM all relevant project documentation as required by the review/estimate team, as well as any other documentation that the project team feels is relevant. This documentation should be received at least 4 weeks prior to the start date of the on-site review, or as otherwise agreed. As an option, the project or review contractor may elect to establish an “eRoom” for posting applicable project documentation. The foundation of the ICR/ICE process is the availability of project documents well in advance of the on-site review. This allows the ICR/ICE team to:

- Determine the adequacy and completeness of the documentation, thus minimizing expenditure of review (as well as site and project) resources for on-site visits for which the Program, FPD, IPT and contractor are unprepared;
- Identify any additional documentation that should be available at the on-site meeting;

- Develop the Review/Estimate plan to include specific lines of inquiry (LOIs) that will be the focus of the on-site portion of the review;
- Inform the project team in advance of the on-site review of the logistics and specific data and information needed to address review concerns related to the various review elements identified in the Review (or Estimate) Plan; and
- Perform comprehensive assessments without tying up site resources with lengthy on-site visits.

If documentation is submitted less than 4 weeks prior to the requested start date of the on-site review, the review may be postponed.

The review/estimate is a snapshot evaluation by the team of the project status at a specific point in time; it is not a moving picture of project activities and status. The project team is encouraged to provide a checklist of the submitted documentation and the preparation and/or approval date of each document along with the required documentation. If the project

team intends to transmit any additional documents or update any documents already submitted, they should notify OECM and the ICR/ICE team when project documentation is first submitted, noting this information on the documentation checklist.

If project documentation is submitted to OECM and the ICR/ICE team less than 4 weeks prior to the requested start date of the on-site review, the quality of the review may be compromised, and OECM and the team may recommend postponement of the scheduled review site visit start date. Updates of project documentation received within 2 weeks of the on-site visit may cause the review/estimate time to be extended with resultant recommendations being delayed accordingly, so that the ICR/ICE team has adequate time to review documentation. Exceptions will be handled on a case-by-case basis.

The requirements for project documentation for ICRs and ICEs are somewhat similar to those for EIRs. Specific documentation needs for ICRs, ICEs and ICEs performed in conjunction with an EIR are listed in Appendices C, F, and G. Note that if the and ICE is to proceed in parallel with the EIR, project data (especially design data, cost and schedule assumptions, and other materials, as discussed in Section 5 and the appropriate appendices) may be needed earlier in the timeline than it would be for a stand-alone EIR. Otherwise, the review or estimate process may delay completion of the EIR and jeopardize planned Critical Decision dates. Certainly, the quality of the review/estimate will be affected by late or incomplete information. The Federal scoping meeting should define when necessary project documents need to be made available to the ICR or ICE team. The Project Team should arrange to post the project documents on an electronic site (e-room, FTP site, SharePoint site, etc.) that is available to the ICR/ICE team. (If the Project Team is unable to make such arrangements the OECM Lead or support contractor will need to do so.)

3.4.2 Sufficiency Review

After receipt of the project documentation, the review/estimate team performs a “sufficiency review” to verify that the project documentation is adequate for detailed review and/or preparation of the independent estimate. This review will look at the depth and breadth of the documents and data contained therein. Appendix G contains a sample sufficiency review checklist that the review/estimate team may wish to adapt for the current review/estimate. If necessary, the OECM Lead may arrange for an on-site review of documentation with a subset of the ICR/ICE team to assess project readiness.

If any documents are insufficient to proceed with the review/estimate, the OECM Lead notifies the FPD and provides a list of the documents that are insufficient and reasons or specific information needed for the document to be acceptable. The OECM Lead may organize a conference call with the FPD, project team, and ICR/ICE team to discuss the documentation and any areas needing improvement.

3.4.3 Review/Estimate Plan

After the sufficiency review determines that the documentation is adequate to continue the review/estimate, the OECM Lead, with assistance from the support contractor lead, as applicable, prepares a draft review/estimate plan. Appendix D to DOE G 413.3-9 contains details on the format and content of a typical EIR review plan. The contents of an ICR review plan and ICE estimating plan are similar, adjusted as needed to the scope of the ICR or ICE. The review plan includes background and scope information on the project being reviewed; the scope of the ICR or ICE; lines of inquiry (LOIs), schedule for on-site activities, an overall review/estimate schedule, forms to be completed by the project team (e.g., costs and funding tables; and team member assignments and biographical sketches. If a combined EIR/ICE is being conducted, an integrated review/estimate plan is normally prepared.

The OECM Lead sends the draft review plan or estimate plan to the FPD for review and input. A conference call to discuss interfaces, interviews, schedules, and team logistics is usually conducted after the draft report is sent. After receipt of FPD input and team comments, the OECM Lead issues the final review/estimate plan.

3.5 Review/Estimate Process

This section provides information on the processes for conducting ICRs, ICEs, and combined EIR/ICE for CD-2. Appendices B, E, and G provide further details on these processes.

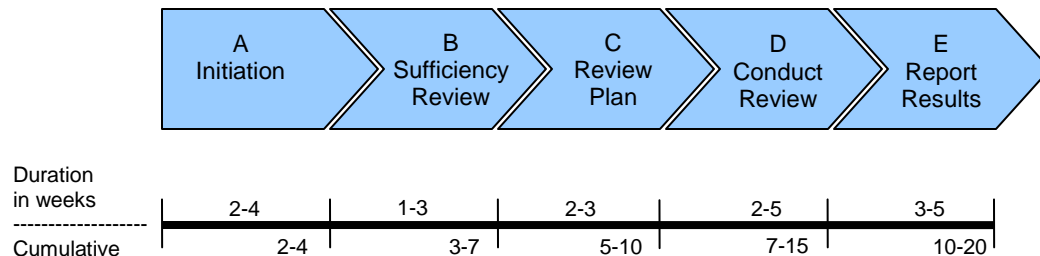
3.5.1 ICR Process

An ICR may be a separate activity or may be combined with another review such as an EIR or an Independent Project Review (IPR) conducted by the program office’s

PMSO. If the ICR is conducted as part of the EIR, the ICR process will be embedded within the EIR process, using the same basic timeline. Note that the documentation required for an ICR is slightly different than for the cost review portion of an EIR. Consequently, that portion of the EIR is simply replaced with the ICR section. The ICR is more comprehensive than a typical EIR cost review. At a minimum, an ICR would examine more WBS elements than would a typical EIR cost review—enough to cover at least 75% or more of the TPC. Hence, an EIR with an “embedded” ICR may take longer than a standard EIR, and may require additional resources compared to the traditional EIR.

Figure 3 depicts the ICR process when the ICR is a separate activity (with no associated EIR or IPR). This ICR process takes a nominal 10 to 20 weeks depending on the scope of the review and project complexity.

Figure 3. Simplified ICR Process Diagram and Timeline



Step	Activity	Nominal Durations
A	Initiation Activities (planning, scoping, SOW and task assignment to SME support team, kickoff meeting)	2-4 weeks after scoping meeting
B	Sufficiency Review (receive and evaluate program documents; perform acceptance—sufficiency—review) — see Appendix K for decision analysis if documentation is not sufficient to continue with ICR.	1-3 weeks after receipt of project documentation
C	Review Plan (draft and final); coordinating call with project team	2-3 weeks
D	Conduct Review (additional document review, on-site review, out-brief, completion of document review)	2-5 weeks
E	Report Results (draft report, factual accuracy review, briefings of OECM management and program management, issue resolution, final report)	3-5 weeks

Section 4 and Appendices B and C provide further information on ICR processes and requirements.

3.5.2 ICE Process

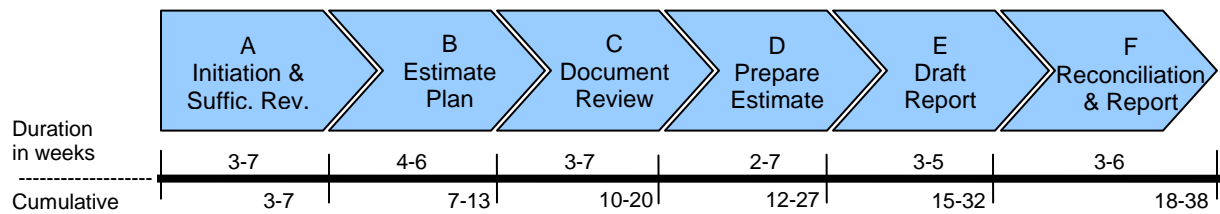
The ICE process, while similar to the ICR process in many respects, also differs significantly in that an ICE results in a cost estimate which is reconciled with the project team's estimate. The reconciliation process is not the same as the corrective action process which is used in both ICRs and EIRs. The conclusion of the ICE activities does not necessarily signify a resolution of differences that results in agreement between the two estimates. There may continue to be differences between an ICE and a project team estimate even following reconciliation. Section 5.8 provides further information on the ICE reconciliation process.

An ICE is performed using an unconstrained funding assumption, as discussed in Sections 5.2–5.5.

This section discusses a separate ICE process. If the ICE is conducted as part of the EIR, the ICE process will be embedded within the EIR process, as discussed in Section 3.5.3.

Figure 4 is a simplified diagram of the ICE process that maps ICE elements to the GAO 12-step cost estimating process. Appendix E provides a detailed listing of ICE steps, a detailed process diagram, and additional information on time durations for a typical ICE process. The ICE process is estimated to take a nominal 18 to 38 weeks. The process durations are directly affected by the scope of the project, the availability of quality information, and timely responses by the FPD and project team.

Figure 4. Simplified ICE Process Diagram, Timeline, and Comparison to GAO Estimating Process



ICE Step	DOE ICE Process Steps	GAO 12-Step Process	Nominal Durations
A	Initiation—activities including scoping meeting, task assignment to SME support team, kickoff meeting	Step 1-document purpose	3-7 weeks after scoping meeting
B	Sufficiency Review and Estimating Plan—Draft & Final	Step 2-develop plan	4-6 weeks after receipt of project documentation
C	Documentation Review—review project documents, develop questions/issues On-site review – data collection and clarifying interviews with project	Step 3-define program characteristics, Step 4-determine estimating structure, Step 5-identify ground rules and assumptions, Step 6-obtain data	3-7 weeks
D	Prepare Estimate—Estimate preparation and review – includes estimate and risk/uncertainty analysis	Step 7-develop point estimate and compare to project estimate, Step 8-conduct sensitivity analysis, Step 9-review/conduct risk and uncertainty analysis	2-7 weeks
E	Draft Report—draft Estimate Document -- including team review; OECM review of draft	Step 10-document the estimate	3-5 weeks
F	Reconciliation & Final Report—resolution process; Briefings—OECM management and Program Office; Final Estimate Document to reflect reconciliation and OECM/Project comments. Note. Partial reconciliation may have been	Step 11-present estimate to management for approval Step 12-update estimate (note reconciliation is a process for an independent estimate and not an initial estimate as covered in the GAO guide)	3-6 weeks, depending on project response time & number of issues

ICE Step	DOE ICE Process Steps	GAO 12-Step Process	Nominal Durations
	performed for after the review of project assumptions and baseline (see Section 7.8).		

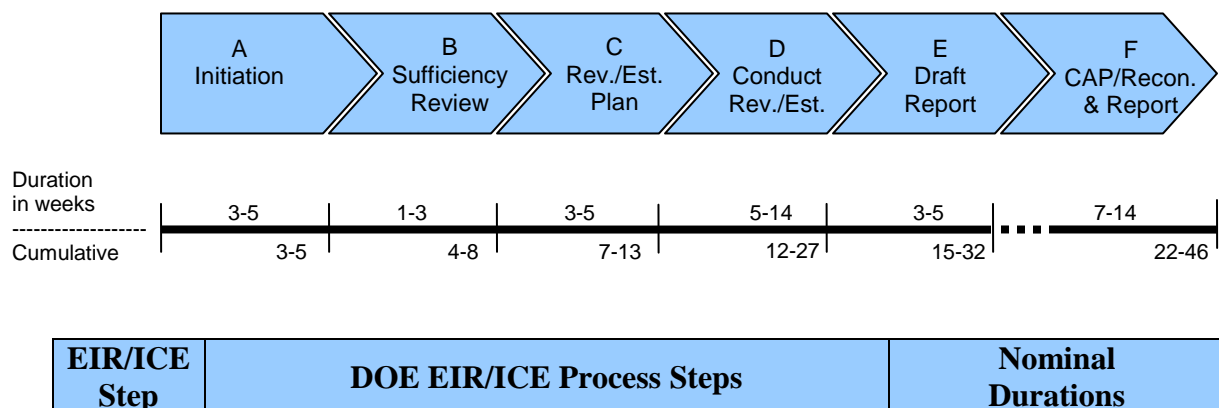
3.5.3 EIR/ICE for CD-2 – Combined Process

If the ICE is conducted as part of an EIR, the ICE process may be embedded within the EIR process, using a revised timeline that is normally longer than the traditional EIR timeline process due to the additional workload. Note that the documentation required for an ICE is somewhat different than for the EIR (or IPR) cost review. Consequently, the cost review portion of the EIR/IPR is replaced by the ICE. When performed as an integral activity, the EIR review plan and ICE estimating plan is usually combined into an integrated plan.

Figure 5 is a simplified diagram of the EIR/ICE process with nominal durations in weeks. Appendix L provides a detailed listing of the steps, a detailed process diagram, and additional details on the duration for a typical EIR/ICE process for CD-2. The EIR/ICE process durations are directly affected by the scope of the project, the availability of quality information, and timeliness of responses by the FPD and project team.

While a combined effort is normally conducted, EIR and ICE processes may also be performed separately. Notably, separate ICE and EIR reports should be prepared irrespective of whether the respective evaluations are performed jointly or separately. Separate activity could occur if the project team has completed the cost estimate but other portions of the project, such as safety reviews, are not ready for the EIR. In this setting, the ICE process would start ahead of the EIR process. If the processes are conducted independently, the separate EIR and ICE processes would be followed. Here again, a single contractor or separate ICE and EIR contractors could be used.

Figure 5. Simplified CD-2 EIR/ICE Process Diagram and Timeline



EIR/ICE Step	DOE EIR/ICE Process Steps	Nominal Durations
A	Initiation—activities including scoping meeting, task assignment to SME support team, kickoff meeting. Note: two separate teams may be formed, integrated by the OECM lead, or an integrated team with review and estimate sub-teams assigned.	3-5 weeks after scoping meeting
B	Sufficiency Review – for both the EIR and ICE activities	1-3 weeks after receipt of project documentation
C	Review and Estimating Plan—Draft & Final; coordinating call with project team	3-5 weeks
D	Conduct Review / Prepare Estimate—Documentation Review—review project documents, develop questions/issues; On-site review – data collection and clarifying interviews with project; Estimate preparation and review – includes estimate and risk/uncertainty analysis	5-14 weeks
E	Draft Report—draft EIR report and Estimate Document -- including team review; OECM review of draft	3-5 weeks
F	Reconciliation & Final EIR/ICE Report—resolution process; Briefings—OECM management and Program Office; Final Estimate Document to reflect reconciliation and OECM/Project comments. Note. Partial reconciliation may have been performed after the review of project assumptions and baseline (see Section 5.8). Reconciliation and CAP are separate processes. The corrective action process may proceed in parallel with final report and reconciliation activities if desired to speed the process; using the draft CAP. The CAP Report is generally a separate report.	7-14 weeks, depending on project response time & number of issues. Note: this process in 4 parts with ICE and EIR activities in parallel: <ul style="list-style-type: none"> • ICE Reconciliation • EIR/ICE Final Report (4-9 weeks for above 2 items) • EIR CAP review • EIR Evidence file review/ CAP report (3-5 weeks for last 2 items)

4. INDEPENDENT COST REVIEW

An ICR is an independent evaluation of a project team's cost estimate that examines the reasonableness of the estimate quality, assumptions, and risks.¹ The following sections provide details on an ICR for each phase of a project, as well as information concerning ICR report requirements. The ICR process is addressed in detail in Section 3.5.1 and Appendix B. Appendix C identifies LOIs and documents required when conducting an ICR.

Appendix D contains a checklist for evaluating project documentation sufficiency and estimate reasonableness.

The Office of Management Project Management website contains a Statement of Work Checklist for use when obtaining contractor support for an ICR: <http://energy.gov/management/office-management/operational-management/project-management/reviews-and-validations>

4.1 ICR for CD-0

The purpose of the ICR prior to Mission Need approval is to evaluate the reasonableness of the initial ROM cost range based on the statement of mission need. At the mission need approval stage, a proposed project may not yet be associated with a particular site(s), and it is generally premature to have selected a design concept developed a physical definition. Functional requirements that must be met should be defined at this stage. (See DOE O 413.3B, Appendix A, section 4.a (page A-4) and DOE G 413.3-17). To develop the rough order-of-magnitude (ROM) cost range, a list of possible solutions is needed with enough definition to allow some level of cost estimating. However, these possible solutions are not intended to restrict the investigation of alternatives conducted during the conceptual design and alternative selection phase of the project.

The primary use of the CD-0 initial ROM range estimate is to provide decision-makers a frame of reference relative to potential future resource requirements. It also indicates the organizational level at which the Acquisition Executive will likely be located. CD-0 ROM range estimates of project cost and schedule should not be considered preliminary cost and schedule estimates for a particular capital asset project, because no specific capital asset alternative has been selected. Similarly, the estimates should not be considered budget-quality, since they are likely to change as more detailed project requirements and design concepts evolve during the conceptual design stage. Therefore, no subsequent evaluation of project performance (i.e., success or failure) should be made relative to the initial ROM range estimates.

¹ DOE, O 413.3B, Att2. p7

Important considerations in an ICR for CD-0, compared to estimate reviews for other project stages, are to evaluate the functional requirements and the range of possible solutions, since the requirements and range of solutions may be the only basis for the estimate. To perform this review, SMEs who are experienced in similar programs and functions are needed.

4.2 ICR for CD-1

In preparation for CD-1, the project team should have developed a conceptual design report including estimated design and construction costs and schedules for various alternatives, and a life-cycle cost estimate (LCCE) for at least the recommended alternative. If the LCCE is a significant factor in the alternative selection recommendation, then the project team should have prepared LCCEs for all the alternatives as noted in OMB Circulars A-11 and A-94. Guide 413.3-21 provides further information on preparing a LCCE.

Appendix A outlines a process for determining whether an ICR or ICE should be performed. In most instances, an ICR will be performed at CD-1, but an ICE may be warranted if the ICR Team determines that there is significant uncertainty as to the quality of the range estimate or the ability of the project/program team to develop a reasonable estimate.

Typically, the ICR should review the estimates for all of the various alternatives so that if issues are found with the reasonableness of the recommended alternative's cost and schedule, the suitability of the alternatives may also be evaluated by the AE making the CD-1 alternative selection.

4.3 ICR for Other Project Phases

An ICR may be conducted at other project phases as requested by the AE or other officials. The scope of the review, documentation required, and the LOIs (see Appendix M) should be tailored for the specific project phase.

4.4 ICR Report

An ICR Report should be prepared and reviewed by the ICR team at completion of the review. The ICR Report should contain the following general sections:

- Executive Summary
- Project Background
- Key Performance Parameters
- Cost Estimating Process
- Basis of Estimate
- Schedule
- Risks
- Summary of Findings
- Recommendations

The length and level of detail in the report should be tailored based on the stage (e.g., CD-0, CD-1 or CD-2) and complexity of the project. An ICR is essentially a Type 2 ICE, which is also referred to as a Reasonableness Review. The ICR team is expected to review all available project documentation, receive briefings from and hold discussions with the project team, complete sufficient analysis to assess the reasonableness of the project assumptions supporting the cost and schedule estimates, ascertain the validity of those assumptions, assesses the rationale for the methodology used, and check the completeness of the estimate, including appropriate allowances for risks and uncertainties. The result should be a report that sufficiently documents what work was done and that details the findings and recommendations.

Draft and Final reports should be issued. The project team, Program Office, and other stakeholders should be provided an opportunity to correct any factual errors or misrepresentations in the Draft report or to provide any additional information that may be required. Unless the IPR team considers the corrections to any factual errors or misrepresentations to be material to its findings, the findings and recommendations in the Final report should be essentially the same as those in the Draft report.

4.4.3 ICR Report Transmittal

OECM should transmit the final ICR Report should be transmitted to the Acquisition Executive, or if the ICR was requested by another party, the appropriate requesting party.

5. INDEPENDENT COST ESTIMATE

An ICE is a cost estimate prepared by an organization independent of the project sponsor, using the same detailed technical and procurement information to make the project estimate. It is used to validate the project estimate and determine its reasonableness.² An ICE typically uses alternative methods and tools to those used for the project estimate. In addition, an independent risk analysis and an independent schedule assessment are usually conducted as part of an ICE. A completely independent schedule development may also be performed if requested by the AE or PSO. Scope and schedule reviews are part of ICR/ICE activities, because a project estimate cannot be validated either the scope or schedule on which it is based is incomplete or unrealistic.

For OECM-sponsored ICEs, the ICE is performed on the unconstrained budget case.

Section 3.5.2 describes the ICE process for a stand-alone ICE, while Section 3.5.3 describes the process for a combined EIR and ICE at CD-2. Appendices E, F and G provide details on the ICE and EIR/ICE for CD-2 processes. The following sections

² DOE O 413.3B, Att2. p7

various types of ICEs, conduct of the ICE, the ICEs performed at various project phases, the ICE report, and the estimate reconciliation process.

5.1 Types of ICEs

DOE classifies ICEs into five Types (or methods), as listed below. Only Types III, IV, and V (and combinations) are considered truly independent cost estimates for purposes of satisfying DOE O 413.3B critical decision requirements. A Type II ICE corresponds most closely to an ICR, as noted in Section 4.4.

An ICE often combines more than one of the approaches and techniques described below, due to the varying levels and quality of information available. For example, the construction portion of a project may be analyzed using Type V principles, while the project management portion may be analyzed using Type II principles. The overall ICE designation will be subjectively determined based on a weighted evaluation of the information available.

These DOE ICE types should not be confused with estimate accuracy classes, which have a different numbering system. See DOE Guide 413.3-21, Cost Estimating Guide, for further information on estimate classes and DOE ICE Types.

5.1.1 Type I (Documentation Review)—this type of review is not normally performed as an ICR/ICE, since it does not fulfill the Critical Decision requirements as specified in DOE O 413.3B. It is merely an inventory of existing documents to determine that the required support documentation exists and to identify any missing data. This type of review can be beneficial for a project that must prepare for an upcoming EIR or ICE, to ensure readiness to proceed with those activities, or when a cursory review is specifically requested at times other than critical decisions.

5.1.2 Type II (Reasonableness Review)—this is the same as the DOE O 413.3B ICR. For this review the ICE team reviews all available project documentation, receives briefings from and holds discussions with the project team, completes the sufficient analysis to assess the reasonableness of the project assumptions supporting the cost and schedule estimates, ascertains the validity of those assumptions, assesses the rationale for the methodology used, and checks the completeness of the estimate, including appropriate allowances for risks and uncertainties. The result is a report that details the findings and recommendations. (See Section 4 above.) A Reasonableness Review can and often does comprise a portion of an ICE, but should not be the majority portion.

5.1.3 Type III (Parametric Estimating Approach)—this approach, in addition to incorporating all of the activities needed for a Reasonableness Review, utilizes parametric techniques, factors, etc., to analyze project costs and schedules. It is usually accomplished at a summary WBS level. The parametric techniques—including cost estimating relationships (CERs) and factors—should be based on accepted historical cost/schedule analyses. An estimate with a minimum of 75

percent of the TPC based on parametric techniques is classified as a parametric estimate. This method analyzes data from completed analogous programs and is derived using the most defensible mathematical and statistical techniques.

5.1.4 Type IV (Sampling Approach)—this review also begins with the activities needed for a Reasonableness Review, but in addition requires the ICE team to identify the key cost drivers. A “cost driver” is a major estimate element whose sensitivity significantly impacts TPC. Detailed, independent estimates should be developed for these cost drivers. Such estimates should include vendor quotes for major equipment, and detailed estimates of other materials, labor, and subcontracts. For the balance of the project costs, the project’s estimate may be used (if deemed reasonable), or, if appropriate, parametric techniques may be used for certain portions of the project costs. An estimate which provides a detailed cost for all cost drivers is classified as a Sampling Estimate. Note that cost drivers are both the key elements making up the estimate and elements that significantly influence the estimate, such as special process equipment or systems, structural features, and hazard category requirements. An independent schedule assessment and cost/schedule risk analyses are typically conducted as well.

5.1.5 Type V (Bottom-up Estimating Approach)—this is the most detailed and extensive ICE effort. It begins with the activities needed for a Reasonableness Review. In addition, this approach requires a detailed bottom-up independent cost estimate, a schedule assessment, and an independent cost/schedule risk analysis. This will require quantity take-offs/development, vendor quotations, productivity analysis, use of historical information, and any other means available to do a thorough and complete estimate of at least 75 percent of the project’s cost. It may not be possible to do a completely independent estimate on some portions of the project estimate, and for those portions – which should not exceed 25 percent of the total estimate – the project estimate may be used if it has passed the test of reasonableness. (Reasonableness reviews are discussed as part of the ICR process using appropriate LOIs and concluding that the process and results are satisfactory and fit for the estimate purpose.)

5.2 Conduct of an ICE (including ICE Schedule)

Figure 4, Section 3.5.2, provides an overview of the ICE process after scoping and selection of the ICE team, including contractor support. Figure 5, Section 3.5.3, provides the overview of the combined EIR/ICE process for CD-2. The following additional resources are also available:

- Appendix E provides additional details of the ICE process with a nominal time line
- Appendix F lists the documentation needs for each type of ICE
- Appendix G contains details and documentation requirements for a combined EIR/ICE

- A statement of work template for ICE contractor support, if required, is provided on the Office of Management Project Management website: <http://energy.gov/management/office-management/operational-management/project-management/reviews-and-validations>
- A statement of work template for contractor support on a combined EIR and ICE is provided on the Office of Management Project Management website: <http://energy.gov/management/office-management/operational-management/project-management/reviews-and-validations>

5.3 ICE for CD-1

DOE O 413.3B requires an ICR or ICE at CD-1 for projects with a TPC greater than or equal to \$100M. Appendix A provides guidance for determining whether an ICR or an ICE should be conducted. The scoping process with the Project Office should initially determine if an ICR or ICE is to be conducted. As discussed in Appendix A, if an ICR is initiated, it may subsequently develop into an ICE if warranted. If an ICE is performed, the expectation is that a Type III ICE (Parametric Estimate) is an appropriate type of ICE for this project stage; however, the specifics as to the estimate methods to be used should be developed as part of the Estimate Plan. At CD-1, project cost and schedule ranges are established for the selected alternative and other alternatives are also evaluated. Life-cycle costs are also evaluated and used in selection of the preferred alternative. If the LCCE is a significant factor in the alternative selection decision, then LCCEs are expected to be prepared for all the alternatives considered. Doe Guide 413.3-21, Cost Estimating Guide, provides additional information on LCCEs.

5.4 ICE for CD-2

DOE O 413.3B requires that an ICE be prepared at CD-2 for projects with a TPC greater than or equal to \$100M. Depending on the maturity of the project design at CD-2 and other factors, the ICE could range from Type III to Type V, with a combined Type III-IV being most likely. DOE O 413.3B, Section C.4, Design Maturity, discusses the appropriate maturity depending on various project factors. Appendix A provides further guidance on the type of ICE to be conducted; however, the specific methods to be used will be determined as part of the Estimate Plan preparation.

Since an EIR is required for CD-2 (for projects with a TPC \geq \$100M, the usual approach is to combine the EIR and ICE into an integrated activity. Sections 3.5.3 and Appendix G provide guidance on the combined EIR/ICE. If for project-specific reasons, OECM decides to conduct the EIR and ICE separately, the individual EIR and ICE sections and appendices in this SOP and the EIR SOP provide guidance on performing separate reviews.

5.5 ICE for CD-3

For projects with a TPC greater than or equal to \$100M, an ICE may be required, depending on project risk and performance. At Cd-3, the project design should be complete enough to allow a Type V ICE to be performed. However, the type of ICE should be based on a project risks and performance considerations, as discussed in Appendix A. Available time and budget may also factor into the decision making process. The specific estimating methods to be used will be determined as part of preparing the Estimate Plan. The process for a combined EIR/ICE at CD-3 is generally the same as for CD-2. See Section 3.5.3 for the combined process.

5.6 ICE for Other Project Stages

For projects at different stages and in between stages, including Baseline Change Proposals (BCPs), an ICE, if required, should be scoped using the guidance in Appendix A. Tailoring is expected in order to fit the ICE to the need or use.

5.7 ICE Report

At the end of the estimate preparation, the ICE team prepares a report to document the ICE process and results. A draft report is prepared initially, followed by a factual accuracy review, estimate reconciliation, and a final report. The process is outlined in the following steps:

- A draft report is generated which represents the consensus of the ICE team, and which includes the team leader's observations and comments.
- The draft report is transmitted to the project office for review and comment.
- The ICE team reviews the comments to determine whether the major differences between the project estimate and the ICE can be resolved via a teleconference, or if a face-to-face meeting is required for reconciliation.
- The ICE team and project team conduct reconciliation activities.
- A final ICE report is prepared, which reflects any changes resulting from the reconciliation process.
- Note: Reconciliation may be done in stages as discussed in Sections 3.5.2 and 5.8.

Nominal Contents for the ICE Report:

- Executive Summary
- Background (including project cost/baseline history)
- Project Status
- Technical Baseline Description (including project scope statement)
- Information available to the ICE team
- Cost estimate method (s) used
- Assumptions (for both Project and Estimating Team)
- Cost estimate results
- Cost Variance Analysis by WBS

- Schedule Analysis/Variance
- Funding Profile Analysis/Variance
- Independent Risk Analysis
- Contingency Analysis
- Reconciliation Open Items – open items (completed after reconciliation process) included in Final Report
- Reconciled Results (in Final Report after reconciliation process)
- Conclusions
- Appendices: Assignments and biographical sketches of team members; cost tables, others as needed

If an ICE is performed in conjunction with an EIR, separate ICE and EIR reports should be prepared, and the ICE report should either be incorporated into the EIR report by reference or included as an attachment. The cost section of an EIR report has very specific format requirements, including a number of cost tables that must be completed. Pertinent cost data that is needed for the EIR should be extracted from the ICE report and adapted as necessary to meet the format requirements of the EIR report. Note that including the ICE information in the EIR report may delay completion of the EIR report compared to a separate EIR process.

For archival purposes, the ICE team should save the report, review plan, as well as all documentation gathered from the review (electronic media files) on a CD(s)/DVD(s). The ICE team should identify Lessons Learned as applicable, in separate correspondence (not part of the ICE report).

Formal transmittal of the final ICE report, either as part of another report, e.g., an EIR report, or separate, will be from the Director of OECM to the appropriate Deputy Administrator (DA) or PSO.

5.8 Reconciliation

A key element of any ICE is a comprehensive reconciliation between the ICE Team estimate and the Project Team estimate. Reconciliation identifies areas of significant difference between the estimates, attempts to explain the reasons for those differences, and seeks consensus where differences are present. This information provides a useful basis for subsequent estimate (cost range or baseline) approval, or for the identification of necessary estimate revision and refinement.

The ICE Team should keep the following reconciliation points in mind:

- The ICE and the project estimate should be updated based on new information or clearer understanding, or to correct errors.
- The reconciliation should focus on possible differences due to:
 - Program definition and scope (including WBS definitions)
 - Estimating Ground Rules and Assumptions

- Consistency of the estimating methods relative to the Program Definition & Scope
- Limitations of estimating methods
- Inputs for estimating methods
- Interpretation of the sources and impacts of risk
- Reconciliation can be done in stages – e.g., ground rule assumptions, evaluation of baseline, completion of estimate
- Reconciliation does not necessarily mean consensus.
- Reconciliations are non-adversarial.

6. REVIEW EVALUATION AND FEEDBACK

Evaluation and feedback is highly encouraged and valued in an effort to continuously improve and add value to project reviews and independent estimates. Program offices, project teams, and PMSOs are encouraged to provide OECM with feedback on the conduct of the review, including any comments related to:

- Scoping meeting
- Review/Estimate Plan development
- Knowledge and professionalism of the review/estimate team members
- Preparation and support of the review/estimate team
- Resolution conference
- Timeliness and responsiveness of OECM and the review/estimate team
- Quality of the review/estimate and findings/issues/results
- CAP review process

The Office of Management Project Management website contains Feedback Forms: <http://energy.gov/management/office-management/operational-management/project-management/reviews-and-validations> The OECM Lead will distribute forms to the FPD and Program Office representative. Upon completion, the forms should be transmitted to the OECM Section Leader who oversees EIRs, ICEs and ICRs. That individual will share the information, as appropriate, with the OECM Contracting Officer's Representative (COR) who oversees support contractors. The confidentiality of the submitter(s) of the forms will be maintained, and feedback will be communicated only through compilations.

Upon OECM request, the review/estimate team should document lessons learned in separated correspondence to the OECM Lead, copy to the OECM COR for support contractors.

ACRONYMS

AE	Acquisition Executive
ANSI	American National Standards Institute
AP	Acquisition Plan
AS	Acquisition Strategy
ASME	American Society of Mechanical Engineers
BCP	Baseline Change Proposal
BOD	Beneficial Occupancy Date
CAP	Corrective Action Plan
CCB	Change Control Board
CD	Critical Decision
CDNS	Chief of Defense Nuclear Safety
CDR	Conceptual Design Report
CFO	Office of the Chief Financial Officer
CFR	Code of Federal Regulations
CNS	Chief of Nuclear Safety
CRD	Contractor Requirements Document
CSDR	Conceptual Safety Design Report
CSVR	Conceptual Safety Validation Report
CTA	Central Technical Authority
DA	Deputy Administrator
DOE	U.S. Department of Energy
EIA	Electronic Institute of America
EIR	External Independent Review
EM	Environmental Management
EO	Executive Order
ESAAB	Energy Systems Acquisition Advisory Board
EVMS	Earned Value Management System
FAR	Federal Acquisition Regulation
FPD	Federal Project Director
FIMS	Facility Information Management System
FY	Fiscal Year
G	Guide
GAO	Government Accountability Office
GPP	General Plant Project
ICE	Independent Cost Estimate
ICR	Independent Cost Review
IG	Inspector General
IPA	Intergovernmental Personnel Act
IPR	Independent Project Review
IPT	Integrated Project Team
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System

KPP	Key Performance Parameter
LEED	Leadership in Energy and Environmental Design
LOI	Lines of Inquiry
MIE	Major Items of Equipment
MNS	Mission Need Statement
M&O	Management and Operating
NDIA	National Defense Industrial Association
NEPA	National Environmental Policy Act
NNSA	National Nuclear Security Administration
NRC	U.S. Nuclear Regulatory Commission
NQA	Nuclear Quality Assurance
O	Order
OBS	Organizational Breakdown Structure
OE	Operating Expense
OECM	Office of Engineering and Construction Management
OMB	Office of Management and Budget
OPC	Other Project Costs
ORR	Operational Readiness Review
P	Policy
PARS	Project Assessment and Reporting System
PB	Performance Baseline
PDRI	Project Definition Rating Index
PDS	Project Data Sheet
PDSA	Preliminary Documented Safety Analysis
PED	Project Engineering and Design
PEP	Project Execution Plan
PHAR	Preliminary Hazard Analysis Report
PL	Public Law
PMB	Performance Measurement Baseline
PMCDP	Project Management Career Development Program
PMSO	Project Management Support Office
PMSC	Program Management Systems Committee
PSDR	Preliminary Safety Design Report
PSO	Program Secretarial Officer
PSVR	Preliminary Safety Validation Report
PMP	Project Management Plan
QA	Quality Assurance
QAP	Quality Assurance Program
QPR	Quarterly Project Review
RA	Readiness Assessment
RCA	Root Cause Analysis
RMP	Risk Management Plan
ROM	Rough Order of Magnitude
SAE	Secretarial Acquisition Executive
SBAA	Safety Basis Approval Authority
SDS	Safety Design Strategy

SER	Safety Evaluation Report
SOP	Standard Operating Procedure
SPE	Senior Procurement Executive
STD	Standard
TEC	Total Estimated Cost
TIPR	Technical Independent Project Review
TPC	Total Project Cost
TMP	Technology Maturation Plan
TRA	Technology Readiness Assessment
TRL	Technology Readiness Level
USC	United States Code
VE	Value Engineering
VM	Value Management
WBS	Work Breakdown Structure

DEFINITIONS

Contingency: The portion of the project budget that is available for risk uncertainty within the project scope, but outside the scope of the contract. Contingency is budget that is not placed on the contract and is included in the TPC. Contingency is controlled by Federal personnel as delineated in the PEP.

Contract Budget Base (CBB): The initial contract value, exclusive of fee or profit; $CBB = PMB + MR$ plus any undistributed budget.

Independent Cost Estimate (ICE): A cost estimate prepared by an organization independent of the project sponsor, using the same detailed technical and procurement information to make the project estimate. It is used to validate the project estimate and determine the estimate reasonableness.

Independent Cost Review (ICR): An independent evaluation of a project's cost estimate that examines the reasonableness of the estimate quality, assumptions, and risks.

Key Performance Parameters (KPPs): A vital characteristic, function, requirement or design basis that if changed, would have a major impact on the facility or system performance, scope, schedule, cost and/or risk, or the ability of an interfacing project to meet its mission requirements. A parameter may be a performance, design, or interface requirement. Appropriate parameters are those that express performance in terms of accuracy, capacity, throughput, quantity, processing rate, purity, reliability, sustainability, or others that define how well a system, facility or other project will perform. In aggregate, KPPs comprise the scope of the project. For a typical project, OECM expects about 3-5 succinct, measurable, KPPs to be identified.

Life-Cycle Costs (LCC): The sum total of all direct, indirect, recurring, nonrecurring and other related costs incurred or estimated to be incurred in the planning, design, development, procurement, production, operations and maintenance, support, recapitalization and final disposition of real property over its anticipated life span for every aspect of the program, regardless of funding source.

Major System Project (MSP): A project with a TPC of greater than or equal to \$750M or as designated by the Deputy Secretary.

Management Reserve (MR): An amount of the total contract budget (and schedule) withheld for management control purposes by the contractor. Management reserve is not part of the Performance Measurement Baseline.

Other Direct Costs (ODC): An ODC is a cost that can be identified specifically with a final cost objective that the contractor does not treat as a direct material cost or a

direct labor cost. There are several additional direct costs that can be proposed by the contractor. These additional costs include:

- Special tooling, test equipment;
- Computer services;
- Consulting services; and
- Travel.
- Federal excise taxes;
- Royalties;
- Preservation, packaging, and packing costs; and
- Preproduction costs.

Note: In some cost estimates, other Government direct costs are listed as a separate call out, not to be confused with contractor ODCs.

Other Project Costs (OPC): All other costs related to project costs that are not included in the TEC. OPCs will include, but are not limited to: research and development; conceptual design and conceptual design report; startup and commissioning costs; NEPA documentation; PDS preparation; site selection; and permitting requirements.

Performance Baseline (PB): The collective key performance, scope, cost, and schedule parameters, which are defined for all projects at CD-2. Performance Baseline includes the entire project budget (TPC including fee and contingency) and represents DOE's commitment to Congress.

Performance Measurement Baseline (PMB): The baseline cost that encompasses all contractor project work packages and planning packages, derived from summing all the costs from the Work Breakdown Structure. Undistributed management reserve, contingency, profit, fee and DOE direct costs are not part of the Performance Measurement Baseline. The PMB is the benchmark used within EVM systems to monitor project (and contract) execution performance.

Project Definition Rating Index (PDRI): This is a project management tool which is used for assessing how well the project scope is defined. The tool uses a numeric assessment which rates a wide range of project elements to determine how well the project is defined. Refer to DOE G 413.3-12.

Project Engineering and Design (PED): Cost category associated with preliminary design, final design and baseline development. Once CD-1 is obtained, PED funds become available for use on design and/or a statement of work/request for proposal for a design/build project. PED funds are not to be used for construction, long-lead procurement, or major equipment items.

Technology Maturation Plan (TMP): A TMP details the steps necessary for developing technologies that are less mature than desired to the point where they are ready for project insertion.

Technology Readiness Assessment (TRA): An assessment of how far technology development has proceeded. It provides a snapshot in time of the maturity of technologies and their readiness for insertion into the project design and execution schedule.

Technical Readiness Level (TRL): A metric used for describing technology maturity. It is a measure used by many U.S. government agencies to assess maturity of evolving technologies (materials, components, devices, etc.) prior to incorporating that technology into a system or subsystem. Refer to DOE G 413.3-4.

Total Estimated Cost: All engineering design costs (after conceptual design), facility construction costs and other costs specifically related to those construction efforts. TEC will include, but is not limited to: project, design and construction management; contract modifications (to include equitable adjustments) resulting in changes to these costs; design; construction; contingency; contractor support directly related to design and construction; and equipment rental and refurbishment.

Total Project Cost (TPC): All costs between CD-0 and CD-4 specific to a project incurred through startup of a facility, but prior to the operation of the facility. Thus, TPC includes TEC plus OPC. $TPC = PMB + MR + \text{contingency} + \text{profit/fee} + \text{other DOE costs}$.

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- 10 CFR Part 830, Subpart B, Safety Basis Requirements.
- 10 CFR 830.206, Preliminary Documented Safety Analysis.
- 10 CFR 830.207, DOE Approval of Safety Basis.
- 10 CFR Part 851, Appendix A, Section 1(d), Worker Safety and Health Program.
- 10 CFR Part 1021, National Environmental Policy Act Implementing Procedures.
- 29 CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals.
- 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response.
- 40 CFR Part 68, Chemical Accident Prevention Provisions.
- 48 CFR 970.5204-2, Laws, Regulations, and DOE Directives.
- 48 CFR 970.5223-1, Integration of Environment, Safety and Health into Work Planning and Execution.
- 50 USC Section 2744, Limits on Construction Projects, and Section 2746, Conceptual and Construction Design.
- American Society of Mechanical Engineers (ASME) Nuclear Quality Assurance (NQA)-1-2008 (Edition) and NQA-1a-2009 (Addenda), Quality Assurance Requirements for Nuclear Facility Applications.
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- ANSI/EIA-748B, Earned Value Management Systems, June 2007.
- Department of Energy Acquisition Guide,
http://management.energy.gov/policy_guidance/Acquisition_Guide.htm.
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- DOE G 413.3-2, Quality Assurance Guide for Project Management, dated 06-27-08.

DOE G 413.3-3, Safeguards and Security for Program and Project Management, dated 11-15-07.

DOE G 413.3-4, Technology Readiness Assessment Guide, dated 10-12-09.

DOE G 413.3-5, Performance Baseline Guide, dated 09-12-08.

DOE G 413.3-6, High Performance Sustainable Building, dated 06-20-08.

DOE G 413.3-7A, Risk Management Guide, dated 1-12-11.

DOE G 413.3-9A, Project Review Guide for Capital Asset Projects, dated 9-23-2008.

DOE G 413.3-10, Earned Value Management System (EVMS), dated 05-06-08.

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DOE G 413.3-12, Project Definition Rating Index Guide for Traditional Nuclear and Non-Nuclear Construction Projects, dated 07-22-10.

DOE G 413.3-13, Acquisition Strategy Guide for Capital Asset Projects, dated 07-22-08.

DOE G 413.3-15, Project Execution Plans, dated 09-12-08.

DOE G 413.3-16, Project Transition/Closeout (CD-4), dated 09-24-08.

DOE G 413.3-17, Mission Need Statement Guide, dated 06-20-08.

DOE G 413.3-18, Integrated Project Teams Guide, dated 09-24-08.

DOE G 413.3-19, Staffing Guide for Project Management, dated 06-03-10.

DOE G 413.3-20, Change Control Guide, DRAFT, dated 07-18-11

DOE G 413.3-21, Cost Estimating Guide, dated 05-09-11

DOE M 470.4-1, Safeguards and Security Program Planning and Management, dated 08-26-05.

DOE O 251.1C, Departmental Directives Program, dated 01-15-09.

DOE O 361.1B, Acquisition Career Management Program, dated 01-24-08.

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DOE O 414.1C, Quality Assurance, dated 06-17-05.

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DOE O 425.1D, Verification of Readiness to Start Up and Restart Nuclear Facilities, dated 04-16-2010.

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NNSA, Independent Project Review Guidance
<http://hq.na.gov/pmnet/default.aspx?L=PAGE&ITEM=18340&CA=17&PI=902>
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GAO Cost Estimating and Assessment Guide: Best Practices for Developing and Managing Capital Program Costs, dated 03-02-09.

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OMB Circular A-94, Guidelines and Discount Rates for Benefit-Cost Analysis of Federal Programs, dated October 29, 1992

APPENDIX A

ICR/ICE Decision-Making Process

This appendix provides some considerations for deciding whether an ICR or ICE should be conducted and if an ICE is selected, what Type (method) should be performed. An actual ICE is usually a combination of Types (methods) with the predominate Type used to classify the estimate. For example, a Type V ICE will usually have less than 25% of the estimated cost developed by Types II – IV estimates.

A. ICR or ICE DOE O 413.3B Requirement:

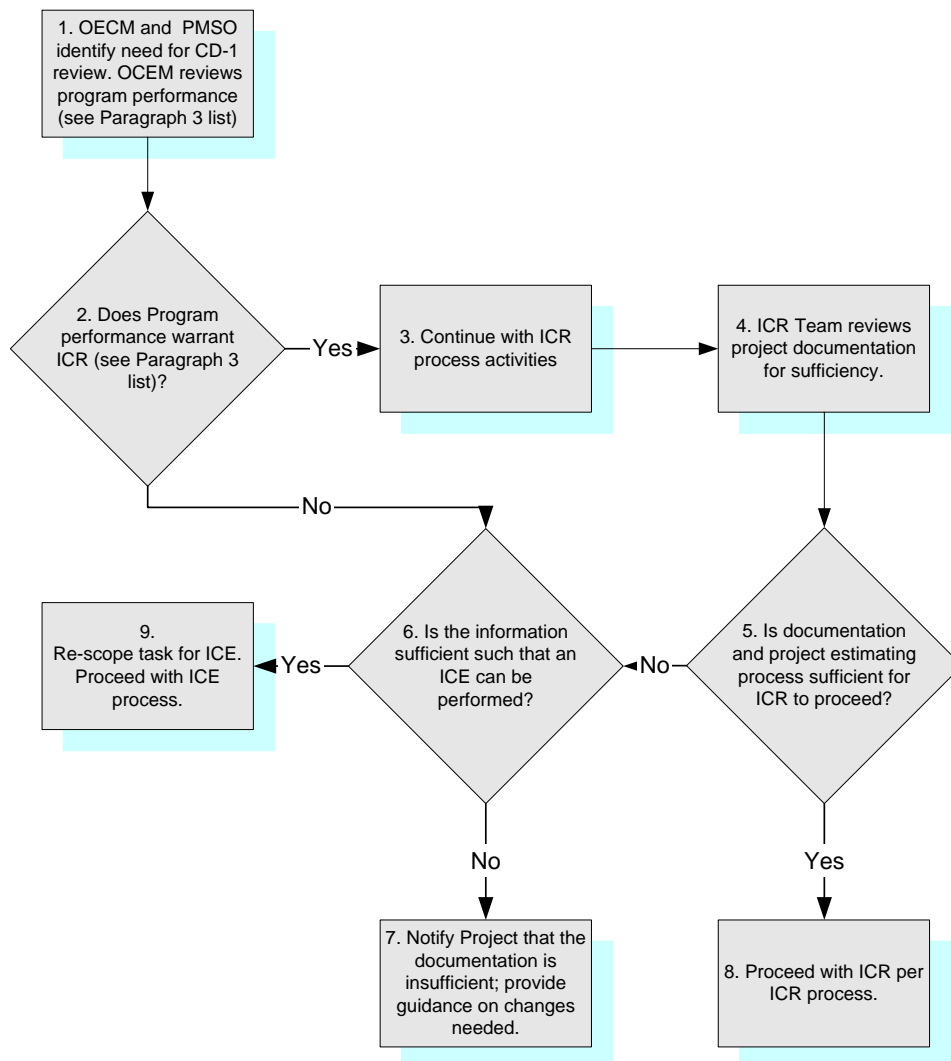
O413.3B Requirements for ICR/ICE			
Phase	Size (TPC)	ICR	ICE
CD-0	>\$750M or SAE	<input checked="" type="checkbox"/>	--
CD-1	>\$100M OECM decides	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
CD-2	>\$100M	--	<input checked="" type="checkbox"/>
CD-3	>\$100M depends on project performance	--	<input checked="" type="checkbox"/>

B. Decision Method for selecting an ICR or ICE at CD-1.

1. An ICR will normally be conducted of the CD-1 cost range and LCCE alternatives unless an ICE is warranted, as discussed in 3 below.
2. Even if an ICR is initially prescribed during the scoping meeting, the ICR may be upgraded to an ICE during the course of the review, such as after the documentation sufficiency review (see Appendix N for sample sufficiency review checklist). The decision flow chart below shows the process that may be followed.
3. An ICE should be performed at CD-1 if the ICR Team determines that there is significant uncertainty as to the quality of the range estimate or the ability of the project/program team to develop a reasonable estimate. See Step 2 in the flow chart below. Factors warranting an ICE instead of an ICR at CD-1:
 - a. Experience: The Program Office, Site Staff and/or Project Team do not have experience in developing and managing similar size projects within the last 10 years. For example, Program Office A has not developed and managed a similar project for more than 15 years.
 - b. Performance on Recent Projects: Program Office, Site Staff and/or Project Team have not developed and managed similar size projects successfully (within cost, schedule, and scope baseline). Example: Site Office B's most recent similar project, just completed, required BCPs for double the cost and an extended schedule more than 1 year over the baseline approved at CD-2.

- c. Performance on Current Projects: The majority of similar sized, current projects are being performed poorly by the Site Office, e.g. RED rated project(s). Example, Site Office C's two current similar sized projects have both tracked RED in the quarterly reviews for the past year.
4. If there is any uncertainty as to whether an ICR or ICE should be conducted, the OECM Lead should only plan for (authorize) the initial phase of the ICR through completion of the sufficiency review and development of the review plan. Then, once agreement is reached, the second phase of review or estimate execution can be authorized. If an ICE is determined to be necessary, then an ICE (estimate) plan should be prepared in lieu of an ICR (review) plan.
5. In any case, the AE may direct that an ICE be performed.

CD-1 ICR-ICE Decision Flow Chart



6. At CD-1, a typical ICE would be a Type III ICE (the majority of the costs estimated by parametric methods). A review of the project team's cost estimate would normally be conducted as part of the ICE.

C. Decision method to select type (method) of ICE (applicable to all project milestone stages).

The type (method) of ICE may parallel the type of estimate used by the project team but use different estimating approaches, i.e., if the project team used a Type V, then the ICE may also be a Type V. If the ICE Team follows the same basic approach, then the team should develop independent information such as rates and quantities or use alternate models to prevent the ICE from only being a math check of the project estimate. Alternatively, the ICE Team may use other estimating methods. The specifics as to the type of ICE would normally be determined as part of developing the Estimate Plan and initial review of the project documentation. An actual ICE is usually a combination of methods, in any case. The following bullets provide some considerations on the type of ICE:

- CD-1: If an ICE is performed, a Type III is usually most appropriate; if similar project data are not available, an ICR (or Type II ICE) is more appropriate. Rarely will there be enough design details to do a Type IV or V.
- CD-2: Type III or IV is usually most appropriate for an ICE; project team should have developed a bottom-up estimate. A Type V ICE may be appropriate depending on project risk or related factors, such as technology, program experience, or quality of the project estimate. A Type IV (Sampling) ICE could include bottom-up estimates for key cost areas (about 50% of the cost) and parametric estimates or detailed reviews for other portions of the estimate.
- CD-3: Type IV or V most appropriate; depends on project risk, and performance results to date (key indicators—CPI, SPI, EAC v. Budget)

D. Factors Affecting Performing an ICE at CD-3

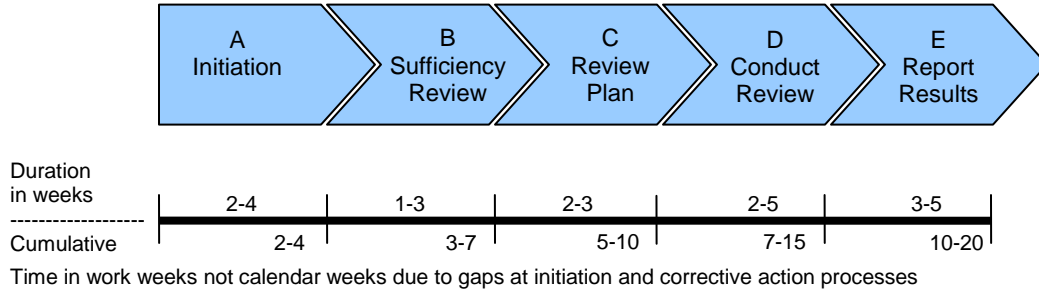
Order 413.3B requires an ICE at CD-3 if warranted by project risk and performance factors. Factors to be considered in a decision by OEM to conduct an ICE include:

- Project risk analysis shows a significant number of project risks rated HIGH.
- The project TRLs are rated at less than a 6 for a majority of the project processes/equipment.
- Project is currently rated RED or YELLOW trending toward RED for the past two quarters. A BCP requiring AE or SAE approval is being planned.

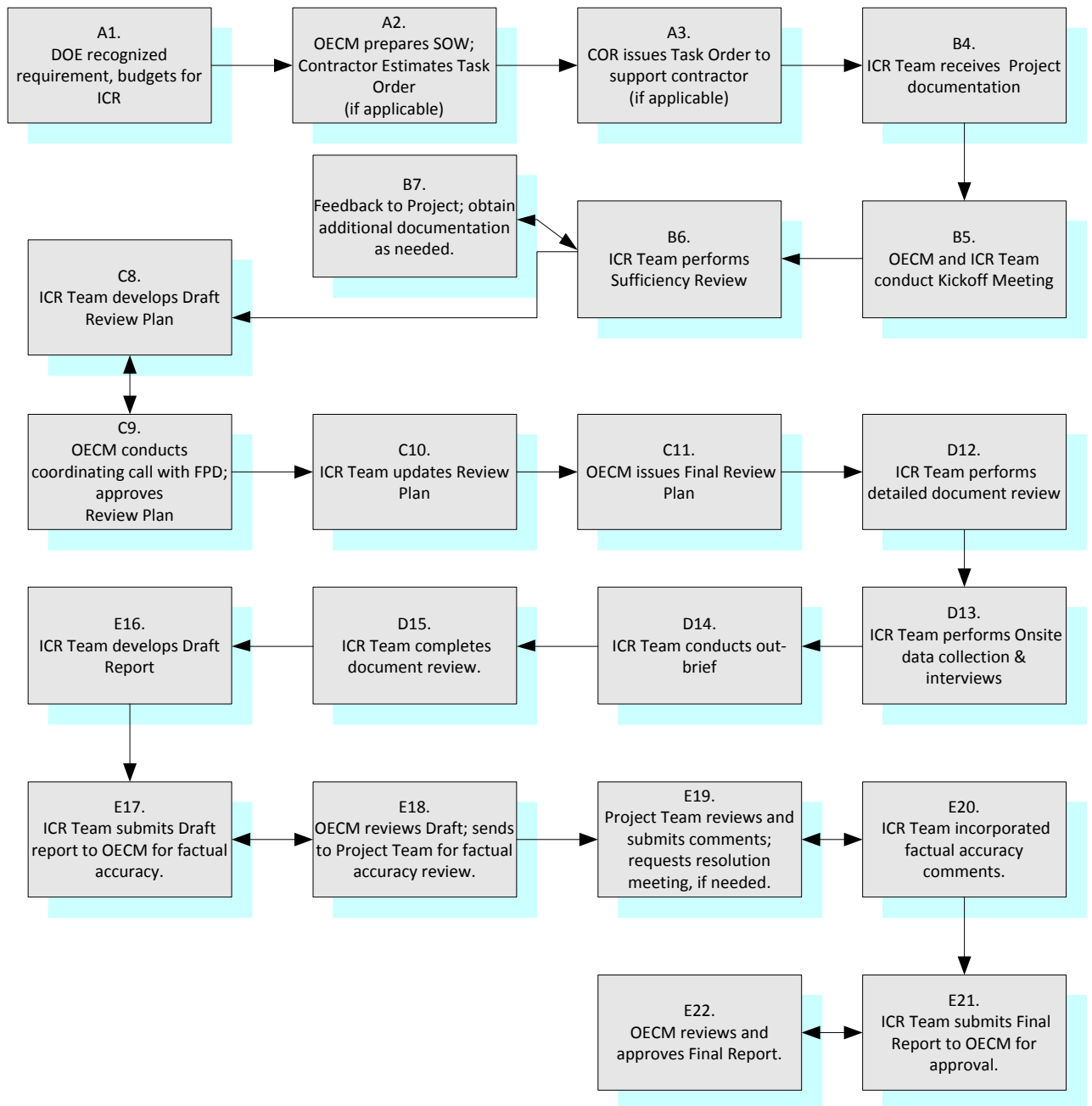
APPENDIX B Conduct of ICR (Process – Timeline)

The simplified process diagram shown below highlights the basic stages of an ICR. The subsequent detailed process diagram shows each individual step in the process. The associated table lists the steps and nominal time ranges. The time and effort should be tailored to the specific project and other factors. A support contractor may or may not be used—see Section 5.2.

Simplified ICR Process Diagram and Timeline (weeks)



ICR Process Diagram



ICR Process

A. Initiation	B. Sufficiency Review	C. Review Plan	D. Conduct Review	E. Report Results
2-4 weeks	1-3 weeks after receipt of documents	2-3 weeks	2-5 weeks	3-5 weeks
1. OECM/ Program Office: DOE requirement recognized, approved, and budgeted. Conduct Scoping meeting. Determine ICR Team composition. Arrange for support as needed.	4. ICR Team: Receive initial project documentation including cost and schedule estimate and Basis of Estimate (if not already done, transmit documents to team). Preferred method of document transmittal is via posting to an electronic site provided by Project Team.	8. ICR Team: Develop Draft Review Plan (include team info, work plan, schedule, LOIs- initial check list)	11. ICR Team: Perform detailed review documentation – as per assignments in review plan; prepare, assemble, & transmit questions to obtain clarifying information or additional documentation	15. ICR Team: Develop draft report (includes entire team review of draft)
2. OECM: Task SOW written and negotiated with contractor (if applicable)	5. Conduct Kickoff Meeting (Conference Call)	9. OECM: holds coordinating call with ICR Team and FPD. Approves Review Plan. If necessary, iterates draft plan with ICR Team.	12. ICR Team: Perform on-site review (if required) – conduct interviews, obtain added info, develop open items, prepare preliminary findings and recommendations	16. a. ICR Team: Submit draft report for factual accuracy to OECM. b. OECM reviews and iterated draft with ICR Team, as needed. When acceptable, issues draft report to Project Team for factual accuracy review. (Note: Project team corrective actions may start using draft CAP
3. OECM: Task order issued (either as separate task or as part of EIR task, if applicable)	6. ICR Team: Perform Initial Sufficiency Review (ensures sufficient information to develop the review plan and perform the review) (see check list,	10. a. ICR Team Updates and submits Final Plan. b. OECM issues Final Review Plan	13. ICR Team: Conduct out-brief – provide preliminary findings to project team; initial feedback on adequacy of estimate – if necessary, obtain	17. Project team reviews draft report and submits factual accuracy comments to OECM and ICR Team. May request OECM hold resolution conference, if

A. Initiation	B. Sufficiency Review	C. Review Plan	D. Conduct Review	E. Report Results
2-4 weeks	1-3 weeks after receipt of documents	2-3 weeks	2-5 weeks	3-5 weeks
	Appendix G)		additional documentation	desired.
	7. ICR Team: Provide feedback on sufficiency review and obtain additional documentation and agreement to proceed (from OEMC). Iterate with Project Team as needed.		14. ICR Team: Complete any additional documentation reviews required	18. ICR Team incorporates factual accuracy comments. Holds resolution teleconference with project team if needed.
	See Appendix C for resolution process if documentation deemed insufficient to proceed with ICR.			19. a. ICR Team: Submit final report to OEMC management for approval. b. OEMC reviews and iterates report with ICR Team, as necessary. c. ICR Team submits final report and additional materials (documentation CD/DVD)

APPENDIX C

ICR EXAMPLE LINES OF INQUIRY AND DOCUMENTATION

CD-0 – Mission Need Rough Order of Magnitude Cost Range Review

An ICR is required for Major System Projects or as designated by the SAE.

Scope of Review: Evaluate reasonableness of the Total Project Cost and Schedule Ranges. Review basis of ROM cost range and provide an assessment of whether this range reasonably bounds the cost and schedule of alternatives to be analyzed in the next project phase. Review basis of schedule range and assess whether the schedule is consistent with strategic requirements for when this project is required. Also, for projects closely linked to other projects, assess whether schedule results in appropriate integration. Note: If this review is not done in conjunction with a Mission Validation Independent Review, assess whether high-level requirements are sufficiently defined to identify potential alternatives (to be analyzed in the Conceptual Design phase) that are both applicable and capable of meeting project goals. Note that “reasonableness” is the judgment of the expert reviewers based on their experience. The summary checklist in Appendix G is a support tool to help communicate the review results.

Documentation Required:

The required documentation is prescribed by the Review Team as part of the Review Plan, as tailored to the specific project. A suggested list to be included in the Review Plan as required documentation, not all inclusive, is as follows:

Description	CD-0 ICR	
	Required	Received
Mission Need Statement, latest draft	●	
Program Requirements Document (Required for NNSA) or equivalent list of functional and program requirements)	●	
Description of legacy program(s)	●	
Ground Rules & Assumptions of the estimate	●	
Rough order of magnitude cost ranges and schedule	●	
Basis of Estimate/Assumptions	●	
Risk Evaluation (part of Mission Need Statement or Separate)	●	
Tailoring Strategy (if required)	●	

Example Lines of Inquiry:

The following are the normal elements and standard Lines of Inquiry (LOIs) that an ICR team should address. Elements may be added or deleted during the ICR scoping process, and LOIs should be further clarified and documented in the review plan. The most important LOIs are in **bold** text. This listing assumes that the ICR is conducted independent of any other reviews. If this ICR is conducted with another review, the LOIs should be tailored as applicable so as not to duplicate LOIs with another review.

(1) Estimate Methods & Approach

- **Assess the method of estimation and the strengths/weaknesses of the estimates for each alternative considered.** Ensure GAO's best practices in cost estimating are encompassed (See Appendix D).
- **Verify that ground rules and assumptions (GR&A) are clearly identified including those related to programmatic, technical, cost and schedule basis, and economic factors.**
- Verify that the GR&A do not impose biases toward future alternative selection.
- Verify that credible and applicable tools and benchmarks including historical data have been used to develop the cost and schedule estimates (i.e., best practices such as those identified in the GAO Cost Estimating and Assessment Guide).

(2) Cost and Schedule Basis

- **Identify and assess the basis for and reasonableness of key programmatic, economic and project cost assumptions as related to the quality of estimates for each alternative considered.**
- Identify whether the estimated costs for the project are reasonable based on professional expertise, parametric estimates, historical data, etc.
- Assess basis for escalation.

(3) Risk & Uncertainty Analysis

- **Verify that reasonable and credible risks and uncertainties have been identified and documented.**
- Verify that a reasonable qualitative (or quantitative) risk assessment has been conducted.
- If new technology or technology applied in a new application were identified, verify that associated risks have been identified and quantified.

(4) Mission and Functional Requirements

- **Verify that appropriate and credible mission and functional requirements have been identified and documented.**
- Verify that appropriate inputs from the requirements are used for the cost and schedule ranges.
- Verify that a mission need date (CD-4) and a path to achieve it have been clearly identified.

(5) Alternatives Considered

- **Verify that appropriate alternatives were considered to ensure that breadth and depth of possible solutions are encompassed in the cost and schedule range.**
- Verify that a PDRI analysis (if performed)—a best practice—is consistent with an evaluation by the ICR team and at an appropriate definition level (target score 300 for pre-conceptual—see G 413.3-12).

(6) Overall Cost and Schedule Range Estimate – Summary

- **Verify that the overall cost and schedule ranges estimated track clearly to the bases of estimate and reflect risks and uncertainty.**
- Verify that the costs and schedule are identified by project phases (design, construction) and possible key milestones.
- Verify that costs for conceptual design (next phase) been identified. Assess the reasonableness of these costs.
- Verify that life-cycle costs have been considered. Assess the reasonableness of these costs.

CD-1 Conceptual Design Alternative Selection and Cost Range Review

For projects with a TPC > \$100M, OECM will conduct an ICR or an ICE as appropriate (DOE O 413.3B, Table 2.1). See Appendix C for the ICR-ICE decision process. These LOIs are for an ICR.

Scope of Review:

Preliminary Cost and Schedule Estimates. Evaluate reasonableness of the Total Project Cost and Schedule Ranges. Review basis of the cost range and provide an assessment of whether this range reasonably bounds the cost and schedule of

alternatives. Assess whether the preliminary cost and schedule estimates include cost contingency and schedule contingency appropriate for the project. Since an IPR is optional at this stage (except for HazCat 1, 2, and 3 nuclear facilities), the ICR or ICE will need to include sufficient review of all alternatives considered to ensure the reasonableness of the cost and schedule ranges. Note that while the project should have selected the preferred alternative, the ICR should look at each alternative to give the AE the full assessment if the recommended alternative is not selected.

Risk Management. Assess whether the key risks for the recommended alternative have been identified with mitigation steps defined. Assess whether the preliminary cost and schedule estimates reflect cost contingency and schedule contingency needed to address risks.

The Acquisition Strategy is also an integral part of the review since the cost and schedule should reflect the selected acquisition strategy.

Required Documentation:

The required documentation is prescribed by the Review Team as tailored to the specific project. A suggested list to be included in the Review Plan as required documentation, not all inclusive, is as follows:

Description	CD-1 ICR	
	Required	Received
CD-0 Documents (e.g., Mission Need Statement, Approval of Mission Need)	•	
Conceptual Design Report (including Alternative Analysis, Hazard Analysis, site selection criteria, NEPA documentation, system functions and requirements, preliminary cost and schedule estimates)	•	
Project Execution Plan	•	
Cost and schedule basis documents, including assumptions	•	
Project schedule/critical path schedule	•	
Life-cycle cost analysis (for selected alternative; for all alternatives if significant to alternative recommendation)	•	
Risk Management Assessment	•	
Acquisition Strategy	•	

Lines of Inquiry:

The following are the normal elements and standard LOIs that an ICR team should address for CD-1. Elements may be added or deleted during the ICR scoping process,

and LOIs should be further clarified and documented in the Review Plan. The most important LOIs are in **bold** text.

(1) Cost

- **Verify that the conceptual scope, cost, and schedule are firmly supported with sound underlying technical, economic, and programmatic bases, assumptions, and front-end planning.**
- Assess the project PDRI analysis (if performed)—a best practice— and verify that it is consistent with an evaluation by the ICR team and at an appropriate definition level (target score 600 for conceptual—see G 413.3-12).
- Assess that credible cost and schedule ranges have been developed and supported by applicable tools and benchmarks (i.e., best practices such as those identified in the GAO Cost Estimating and Assessment Guide).
- **Verify that the conceptual design is mature enough to support definition and development of credible current TRL definition, WBS elements development and contingency/MR planning, and to support the resolution of constructability issues.**
- Assess the preliminary funding profile identifying funds for design and construction, including the possible use of PED funding.
- **Assess the method of estimation and the strengths/weaknesses of the estimates. Ensure GAO's best practices in cost estimating are followed (See Appendix D).**
- Identify and assess the basis for and reasonableness of key programmatic, economic and project cost assumptions as related to the quality of estimates and risk management planning and contingency requirements.
- Assess the amount of and basis for escalation.
- Identify whether the estimated costs for the project are reasonable based on professional expertise, parametric estimates, historical data, etc.
- Verify that the cost value of schedule contingency is included in the cost range.
- Assess the basis and reasonableness of the LCCEs for the alternatives considered and the selected alternative. Complete LCCE table, see below.

Life Cycle Cost Estimate – Alternative <u>x</u>		
Cost Element	CD-1 Low Range \$	CD-1 High Range \$
Design		
Construction		
Startup-Testing-Commissioning		
Operations (over _____ years)		
Shutdown, Dismantling, Decommissioning		
Total Life Cycle Cost		

Complete a table for each alternative (identify the recommended alternative).

(2) Schedule

- **Assess the method of schedule estimation and the strengths/weaknesses of estimates.**
- **Ensure constraints imposed in the schedule do not artificially impact the overall schedule range.**
- **Identify and assess the basis for and reasonableness (and consistency with cost estimate) of key programmatic, economic and project schedule assumptions as related to the quality of estimates and risk management planning and contingency requirements.**
- Identify whether the estimated schedule range for the project is reasonable based on professional expertise, parametric estimates, historical data, etc.

(3) Scope

- Assess if the new technology or technology applied in a new application is mature enough and validated through appropriate tools (i.e. comparison with ICR Team's Technology Readiness Assessment).
- Verify that design review comments, integration issues (with Operations and other projects) and constructability constraints have been sufficiently addressed.
- **Assess whether the conceptual WBS and WBS dictionary incorporate all project work scope, and that the defined work scope and system requirements are derived from and consistent with the approved Mission Need and include a clear definition of responsibility for execution of each or the defined portions of work.**
- Assess if the WBS represents a reasonable breakdown of the project work scope and if it is effective for internal management control and reporting.

- **Identify and assess the basis for and reasonableness of key programmatic, economic, and project scope assumptions as related to the quality and completeness of the WBS, technical and design requirements, and risk management planning and contingency requirements.**
- Identify all underlying technical assumptions and assess whether they are sound and/or appropriately addressed within the Risk Management Plan and adequately supported with contingency, particularly for new technologies that have never been developed and/or prototyped within the proposed environment.
- Assess whether it is reasonable to divide the work scope presented into smaller, discrete (completed and useable) projects to reduce risk. If applicable, identify the basis for managing such discrete projects in an integrated program.)
- Confirm that a Program Requirements Document (PRD) exists (required for NNSA and that project planning reflects the PRD (or equivalent mission programmatic functional and technical requirements for non-NNSA projects).

(4) Risk Management

- **Verify that risks have been identified for the selected alternative and that contingency analyses have been conducted and documented in Risk Management Plan(s) by DOE and its contractor.**
- **Assess adequacy and completeness of both DOE and contractor risk management planning including the method(s) used to identify risks, and whether a reasonably complete list of potential risks was developed for analysis.**
- Determine whether appropriate risk handling and mitigation actions, including accepted risks and residual risks, have been identified.
- Identify and assess cost and schedule management reserve (MR) and contingency (both contractor and DOE).
- Ensure MR and contingency allowances are tied to risk assessments.
- Assess the adequacy of a separate estimate uncertainty analysis included in the determination of MR and contingency?
- Assess adequacy of the qualitative analysis and rating (high, medium, or low) of current risks (including site specific factors such as availability of contractors) for probability of occurrence and for consequence of occurrence.
- Evaluate the extent and adequacy of quantitative risk analysis.

- Evaluate the adequacy of the management control process for risk status/updating.
- Ensure the project team is aware of risk management tools (such as the Centralized Risk Register Tool—see OECM Website for information and link).
- Ensure the project team fully understands the distinction between MR and Contingency (see DEFINITIONS section of SOP).

(5) Management Planning and Acquisition Strategy

- **Review the Acquisition Strategy/Plan to determine if a strategy/plan for successful execution of the project is established, if the project is being executed in accordance with the strategy/plan, and it is consistent with other project documentation.**
- Verify that an appropriate level of project management planning has been performed to ensure project team can complete the next phase of the project.
- Verify that an FPD been assigned consistent with the requirements of O 361.1B.
- Assess the adequacy of a fully integrated (Government and contractor) IPT with appropriate disciplines to support the design activities.
- Assess that the methods and approach planned for project execution appropriately is documented in the PEP.
- **Verify that the selected alternative has been adequately justified on the basis of cost, schedule, and scope.**

ICR for Other Project Phases (e.g., CD-2 or CD-3)

Below is a discussion of required documentation, as well as the Lines of Inquiry (LOIs), that will generally form the scope of a CD-2 and/or CD-3 ICR. Additional elements or LOIs beyond those presented in this document may be based on unique aspects of the project being reviewed and decisions reached during the scoping meeting. Both the ICR scope and required documentation may vary depending on the type of project and any tailoring that may be applied to the ICR. For projects with TPC > \$100M, O413.3B requires an ICE at CD-2. An ICE may also be required at CD-3 depending on performance and risk factors.

Required Documentation for the CD-2 and CD-3 ICR:

In general, the following documents (or equivalents) are normally required for a CD-2 and CD-3 ICRs. Other material may be requested by OECM and the ICR team to ensure a complete and accurate review is performed. Note: if the ICR is performed in conjunction with an EIR, then the documentation required should be consolidated with the EIR list.

Description	CD-2 ICR		CD-3 ICR	
	Required	Received	Required	Received
CD-0 Documents (e.g., Mission Need Statement, Approval of Mission Need)	•		•	
CD-1 Documents (e.g., Approval of Alternative Selection and Cost Range, Conceptual Design Report)	•		•	
CD-2 Documents (e.g., Approval of Performance Baseline)			•	
Work Breakdown Structure (WBS) and WBS Dictionary	•		•	
Detailed Resource Loaded Schedule (RLS)	•		•	
Summary project or milestone schedule	•		•	
Detailed Cost and Schedule Estimates, including Basis of Cost Estimate, Basis of Schedule Estimate, and all project-basis and assumptions	•		•	
Detailed bottom-up Cost and Schedule Estimates based on the completed design (includes bases of estimate and assumptions)			•	
Program Requirements Document (or equivalent)	•		•	
Cost estimate backup, including vendor quotations, parametric formulas, engineering calculation, historical costs, and the like	•		•	

Description	CD-2 ICR		CD-3 ICR	
	Required	Received	Required	Received
Critical Path and Near-Critical Path Schedules	•		•	
System Functions and Requirements Document (also referred to as the "Design-to" requirements or Design Criteria)	•		•	
Results of and Responses to Project Design Reviews and Technical Independent Project Reviews	•		•	
Design Review Report and comments resolution	•		•	
Constructability Reviews			•	
Project Execution/Management Plans	•		•	
Evidence and results of constructability reviews of the design	•		•	
Federal and contractor organization chart and staffing plans	•		•	
National Environmental Policy Act documentation identifying EIS and/or permit requirements and status	•		•	
Hazards Analysis Report	•		•	
DNFSB or NRC open issues	•		•	
Documentation of DOE and DFNSB (or NRC) endorsement of design and operational safety basis.	•		•	
Start-up Testing and Turnover Planning documents and other operations readiness plans (as appropriate)	•		•	
Summary of Preliminary Safety Design Report (Hazard Category 1, 2, or 3 nuclear facilities) identifying significant project risks and safety features	•		•	
Preliminary Security Vulnerability Assessment Report	•		•	
Risk Management Plan (RMP)	•		•	
Risk Analysis Report, including probabilistic (e.g. Monte Carlo) results for both contractor and federal risks (if not contained in RMP)	•		•	

Description	CD-2 ICR		CD-3 ICR	
	Required	Received	Required	Received
Updated Risk Management Plan and Risk Analysis Report			•	
Acquisition Strategy/Acquisition Plan	•		•	
Value Management/Engineering Report	•		•	
Pending contract modifications/Requests for Equitable Adjustment	•		•	
All Baseline Change Proposal and disposition documentation			•	
Project Data Sheets	•		•	
Project Funding Profile (Program budget/planning office should identify if this profile is within the Program target budget profile)	•		•	
Regulatory agreement documentation (project commitments, milestones, deliverables, dates)	•		•	

Example Lines of Inquiry

The most important LOIs are in **bold** text. Note: if the ICR is conducted in conjunction with an EIR, then the EIR and ICR LOIs should be consolidated with the ICR LOIs taking precedence for the cost portion of the EIR.

(1) Cost and Basis of Cost

Note. The ICR team should evaluate the entire cost estimate and cost basis. Selected WBS elements may be reviewed in more detail (e.g., pick WBS elements that comprise at least 75% of the total cost)

- Verify that the cost is firmly supported with sound underlying technical, economic, and programmatic bases, assumptions, and front-end planning (i.e., PDRI—Project PDRI analysis required for CD-2, recommended for CD-3).
- Verify that credible and sufficiently complete cost and schedule baselines have been developed and supported by applicable tools and benchmarks (i.e., best practices such as those identified in the GAO Cost Estimating and Assessment Guide).
- Verify that the funding profile remains intact and is still viable.

- **Assess the method of estimation and the strengths/weaknesses of the estimates for each WBS element reviewed. Assess the credibility of the cost risk distribution for each WBS element (cost uncertainty analysis). Assess completeness of estimate work packages and backup information (e.g., vendor quotes for equipment; unit rates, overhead rates) Ensure GAO's best practices in cost estimating are encompassed (See Appendix D) including sensitivity analyses.**
- **Identify and assess the basis for and reasonableness of key programmatic, economic and project cost assumptions as related to the quality of estimates and risk management planning and contingency requirements.**
- Assess the amount of and basis for escalation.
- Assess reasonableness of resource loading, including what resources are loaded.
- Identify whether the estimated costs for the project are reasonable based on professional expertise, parametric estimates, historical data, etc.
- Verify that the cost value of schedule contingency is included in the TPC
- Verify findings from previous reviews been adjudicated, and the corrective actions are implemented.
- Provide a completed project cost and funding profile table. Completed project cost profile tables are expected in all ICR reports. Additionally, the ICR team should include a milestone schedule graphic to accompany the cost profile table. (See EIR Section 6 for sample tables.)
- Review and provide the basis for the Funding Profile (e.g., latest Project Data Sheet).
- Compare the annual budget with the cost requirements, and provide an assessment of whether the costs and budget are reasonably linked and can withstand normal budget turbulence during fiscal year transition periods (e.g., continuing resolutions, new start restrictions, etc.)
- Identify any significant disconnects between the performance baseline requirements and budget/out-year funding. Determine the reasonableness of the Budget Authority versus Budget Obligation profiles and assess the affordability of the project within the Program's budget profile.
- Validate the funding profile remains viable and intact throughout the project lifetime.

- Include budget/funding information in the following project summary cost profile tables and the detailed cost table.

Project Cost/Funding Profile Summary Tables

Table 1. Budget Cost Breakdown – Funding Source Specific (future and sunk)

Description	<FY11	FY11	FY12	FY13	FY14	FY15	FY16	Total
PED								
Construction								
TEC								
OPC								
TPC								

(Note: above values include MR/Contingency)

Table 2. Project Data Sheet Cost Breakdown – Funding Source Specific

Description	Costs to Date (as of _____)	Costs to Go	Total
PED			
Construction			
TEC			
OPC			
TPC			

Table 3. Earned Value Management System Breakdown – Funding Source Neutral

Description	<FY11	FY11	FY12	FY13	FY14	FY15	FY16	Total
*Contract Budget Base								
Fee/Profit								
Other DOE Direct Costs								
Contingency								
Performance baseline (TPC)								

** Contract Budget Base is inclusive of the Performance Measurement Baseline, any Undistributed Budget, and, Management Reserve.*

Table 4. Earned Value Management System Breakdown – Funding Source Neutral

Description	Costs to Date (as of _____)	Costs to Go	Total
PMB			
Undistributed Budget			
MR			
*Contract Budget Base			
Fee/Profit			
Other DOE Direct Costs			
Contingency			
Performance baseline (TPC)			

** Contract Budget Base is inclusive of the Performance Measurement Baseline, any Undistributed Budget, and, Management Reserve.*

Table 5. Funding Constrained TPC versus Unconstrained TPC

Description	<FY11	FY11	FY12	FY13	FY14	FY15	FY16	Total
TPC (as funded, constrained)								
TPC (if unconstrained funding available)								
Difference								

Table 6. CD-4 Date – Funding Constrained versus Unconstrained

Element	Date (or Months)
Constrained (as currently planned) CD-4 date)	
Unconstrained CD-4 date (if funding available)	
Difference in Months	

Table 7. Life Cycle Cost Estimate - Updated

Cost Element	Original CD-1	Updated
Design		
Construction		
Startup-Testing-Commissioning		
Operations (over ____ years)		
Shutdown, Dismantling, Decommissioning		
Total Life Cycle Cost		

Additional Cost LOIs for ICR in support of CD-3

- **Identify the source and reason for any proposed substantive changes to the RLS since CD-2 relative to its consistency with the approved performance baseline (TPC, CD-4 completion schedule). Assess the basis and justification for these changes.**
- **For selected WBS elements (typically, those constituting significant cost, schedule and/or risk), summarize the detailed basis for the cost or schedule estimate. Identify strengths/weaknesses of the estimates reviewed.**
- Identify and assess any changes since CD-2 to the basis for and reasonableness of key programmatic, economic, and project cost assumptions as related to the quality of estimates, and risk management planning and contingency requirements.
- Identify the amount of, and basis for, escalation. Assess the basis and justification for any changes since CD 2.

- Assess basis of resource loading, including what resources are loaded. Determine if resource requirements factor in project performance since CD-2 or performance of other similar projects in execution.
- Provide an updated project cost profile table (detailed and summary).
- Based on the project cost profile table, develop summary baseline cost tables (i.e., PED, TEC, OPC, TPC, Contract Budget Base, Fee, DOE Direct Costs, and Contingency) and schedule tables of the proposed milestones (i.e., Critical Decision dates and other significant or critical project dates) for the ICR report. Identify and assess the basis and justification for any changes to the TPC and CD-4 schedule since CD-2.

(2) Schedule

- **Evaluate the reasonableness of the overall project schedule, including resource loading and what resources are loaded.**
- For the selected WBS elements, summarize the detailed basis of schedule estimate.
- **Assess the method of estimation and the strengths/weaknesses of estimates.**
- Identify and assess the basis for and reasonableness of key programmatic, economic and project schedule assumptions as related to the quality of estimates for each WBS element, and risk management planning and contingency requirements.
- Determine if schedule contingency is derived quantitatively and if the calculated duration is placed between the end of the last project critical path activity and the “Submit Request for CD-4” milestone.
- Identify whether the estimated schedule for the project is reasonable based on professional expertise, parametric estimates, historical data, etc.
- Include CD milestone data on the project cost profile table referenced above and include summary baseline schedule tables of the proposed milestones (i.e., CD dates and other significant or critical project dates) in the EIR report.
- Assess whether the Critical Path is reasonably defined. Assess whether the Critical Path reflects an integrated schedule and schedule durations are reasonable. (For EIR in support of CD-3) Identify any changes since CD-2.
- Determine if there is a clearly defined critical path leading to submission of the CD-4 request.

(3) Scope

Note: If the ICR is not performed in conjunction with an IPR or EIR, the project scope definition should be reviewed to ensure adequate basis for cost and schedule estimates. If part of an IPR/EIR, these elements (and others) are covered in the review.

- Verify that the scope is firmly supported with sound underlying technical, economic, and programmatic bases, assumptions, and front-end planning (i.e., PDRI).
- Verify that the design has matured to the appropriate degree and been validated through appropriate and credible processes.
- **Assess whether the CD-4 (project completion) activities and requirements and project key performance parameters (KPP) are clearly defined.**
- Verify that the new technology or technology applied in a new application is mature enough and validated through appropriate tools (i.e. comparison with IPR Team's Technology Readiness Assessment).
- Verify that the design review comments, integration issues (with Operations and other projects) and constructability constraints have been sufficiently addressed.
- **Verify that the Basis of Scope (As defined in the Work Breakdown Structure, System Functions and Requirements for CD-2, as defined in the Work Breakdown Structure, final Drawings and Specifications, Final Design Functions and Requirements, and Final Design Criteria for CD-2), is adequately identified and documented..**
- **Assess whether the WBS and WBS dictionary incorporate all project work scope, and that the defined work scope and system requirements are derived from and consistent with the approved Mission Need and include a clear definition of responsibility for execution of each or the defined portions of work.**
- Assess if the WBS represents a reasonable breakdown of the project work scope and if it is effective for internal management control and reporting.
- **Identify and assess the basis for and reasonableness of key programmatic, economic, and project scope assumptions as related to the quality and completeness of the WBS, technical and design requirements, and risk management planning and contingency requirements.**
- Identify all underlying technical assumptions and assess whether they are sound and/or appropriately addressed within the Risk Management Plan and adequately

supported with funded contingency, particularly for new technologies that have never been developed and/or prototyped within the proposed environment.

- Assess whether it is reasonable to divide the work scope presented into smaller, discrete (completed and useable) projects to reduce risk. If applicable, identify the basis for managing such discrete projects in an integrated program.
- Confirm that a Program Requirements Document (PRD) (required for NNSA or equivalent technical and functional requirements for other programs) exists and that project planning reflects the project requirements.

(4) Risk

- Verify that relevant and comprehensive risk and contingency analyses have been conducted and Risk Management Plans have been prepared by DOE and its contractor.
- Assess the approach used to identify and quantify project risks and assess the adequacy of this approach, as well ensure best practices are incorporated.
- **Assess adequacy and completeness of both DOE and contractor risk management planning including the method(s) used to identify risks, and whether a reasonably complete list of potential risks was developed for analysis.**
- **Assess whether all appropriate risk handling and mitigation actions, including accepted risks and residual risks, have been incorporated into the project work plans, cost and schedule.**
- **Identify and assess cost and schedule contingency (both contractor and DOE). Provide an assessment of whether the analysis for and basis of contingency is reasonable for this type of project and its associated risks.**
- Ensure contingency accounts for estimate uncertainty, which is directly tied to design maturity and the estimating methodologies used. Estimate uncertainty should be a separate analysis based on the WBS elements and not risk elements (best practice, see DOE G 413.3-21 and GAO Estimating and Assessment Guide, GA-09-3SP).
- Ensure the project team is aware of risk management tools (such as the Centralized Risk Register Tool).
- Ensure the project team fully understands the distinction between Management Reserve (MR) and Contingency.

Additional LOIs for a review in support of CD-3:

- Identify and assess any substantive changes to the Federal and contractor risk and contingency management plans or processes since CD-2.
- Assess whether the risk assessment and management plan have been updated, as appropriate, to address any new risks identified in final design and evaluate the adequacy of the management control process for risk status/updating.
- Assess MR/contingency drawdown and utilization history for reasonableness, and determine if sufficient contingency remains.

(5) Management Team and Acquisition Strategy/Plan

- **Review the Acquisition Strategy/Plan to determine if a strategy/plan for successful execution of the project is established, if the project is being executed in accordance with the strategy/plan, and it is consistent with other project documentation.**
- Verify that an appropriate level of project management planning has been performed to ensure project team can complete the next phase of the project.
- Verify that an FPD been has been assigned consistent with the requirements of O 361.1B.
- Assess the adequacy of a fully integrated (Government and contractor) IPT with appropriate disciplines to support the design activities.
- Verify that the methods and approach planned for project execution appropriately documented in the PEP.

SAMPLE PROJECT COST PROFILE TABLE

Project Cost Profiles

Project Number(s):

Project Title:

Date updated:

TPC or range (\$K):

Cost Element	FY PY-1 FY 2009	FY PY-2 FY 2010	Total Prior Years	FY BY-1 FY 2011	FYBY- 2 FY 2012	FYBY- 3 FY 2013	
Critical Decision (approvals)	CD-0	CD-1		CD-2	CD-3		

Total Estimated Cost (TEC)

Design (PED)

Design

Contingency

Total, PED

Appropriations

Obligations

Costs

Construction (Post CD-2)

Site Preparation

Equipment

All Other Construction

Contingency

Total, Construction

Appropriations

Obligations

Costs

Total, TEC (Post CD-2)

Cost Element (page 2)	FY PY-1 FY 2009	FY PY-2 FY 2010	Total Prior Years	FY BY-1 FY 2011	FYBY- 2 FY 2012	FYBY- 3 FY 2013
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Other Project Cost (OPC)

OPC except D&D

Conceptual Planning

Conceptual Design

Start-Up

Contingency

Total, OPC except D&D

Appropriations

Obligations
Costs

D&D (Post CD-2)

D&D

Contingency

Total, D&D

Appropriations

Obligations

Costs

Total, OPC

Total, Contingency

Appropriations

Obligations

Costs

Total, TPC (Post CD-2)

APPENDIX D ICR CHECKLISTS

This appendix provides sample check lists to be used during the ICR process to assist in

- sufficiency review of the estimate (initial acceptance review)
- reasonableness review of the estimate (detailed review).

The check lists should help the ICR Team focus on areas of weakness that need more detailed review and to communicate the review results with others. These checklists are not intended to be the total review activity, only part of it and should be tailored to fit the specific project and the review being conducted. The checklists are provided for CD-0 and CD-1. If an ICR is performed at other project stages, checklist should be tailored to suit the project and stage. A sample summary score sheet for the reasonableness review is provided at the end of the appendix. The summary score sheet should be used to highlight the status and communicate results.

CD-0 – Mission Need Rough Order of Magnitude Cost Range Review Sufficiency (Acceptance) Review Checklist

Sufficiency Review Checklist				
The sufficiency review is the initial acceptance review of the documentation received to allow the team to determine if sufficient information is available to perform the detailed review.				
The review team members should answer the questions as noted. Provide comments as appropriate to clarify the answer. Yes is good (complete, sufficient, etc.); no is not.				
Questions	Y e s	N o	N / A	Comments
Documentation				
Was all the documentation received per the requested list?				
If documents are missing, are they insignificant to the estimate review or are equivalent documents available?				
Completeness				
Is a basis of estimate document or equivalent included?				
Are assumptions identified?				
Are mission need (functional and programmatic) requirements identified?				
Does the estimate approach appear logical?				
Is a range of potential alternatives described for purpose of defining the cost and schedule range?				
Is the overall rough order of magnitude construction cost and schedule identified encompassing the alternatives?				
Is there a life-cycle cost analysis for the range of alternatives?				
Is the mission need date identified?				
Are risks and uncertainties described and qualified or quantified?				
Are costs for the next phase (conceptual design) and a funding source identified?				
Summary				
Ready to go or not				

Sample Reasonableness Review Summary Checklist (CD-0)

Reasonableness Review Checklist				
The reasonableness review summarizes the lines of inquiry and review of the documentation for the overall reasonableness of the estimate. Specific findings and recommendations are captured in the ICR report				
The review team members should answer the questions as noted. Provide comments as appropriate to clarify the answer. Yes is good (reasonable or acceptable); no is not.				
Questions	Y e s	N o	N / A	Comments
Documentation				
If additional documentation was requested, was it received in time to support the review?				
Is the documentation package complete and usable as a basis for the estimate?				
Relevance				
Are the approaches used in the estimate appropriate for the information available?				
Are the assumptions appropriate for the project?				
Are appropriate rationales documented for items like engineering judgment?				
Is historical information appropriately used for the estimate?				
Are the mathematical calculations correct?				
Consistency				
Are the methods used for evaluating each alternative appropriate and consistent?				
Is the estimate consistent with the technology maturity?				
Completeness				
Is a full range of possible alternatives identified?				
Does the estimate (cost & schedule) include the full range of alternatives considered (including life cycle costs)?				
Are funding needs and sources identified?				
Risk and Uncertainty				
Are risks and uncertainties appropriately identified?				
Are risks and uncertainties analyzed?				
Are both cost and schedule risk impacts identified?				
Reasonableness				
Is the overall cost range estimate reasonable?				
Is the overall schedule duration range estimate reasonable?				

**CD-1 Conceptual Design Alternative Selection and Cost Range Review
Sufficiency (Acceptance) Review Checklist**

Sufficiency Review Checklist				
The sufficiency review is the initial acceptance review of the documentation received to allow the team to determine if sufficient information is available to perform the detailed review.				
The review team members should answer the questions as noted. Provide comments as appropriate to clarify the answer. Yes is good (complete, sufficient, etc.); no is not.				
Questions	Y e s	N o	N / A	Comments
Documentation				
Was all the documentation received per the requested list?				
If documents are missing, are they insignificant to the estimate review or are equivalent documents available?				
Completeness				
Is a basis of estimate document or equivalent included?				
Are assumptions identified?				
Are functional and programmatic requirements identified?				
Does the estimate approach appear logical?				
Is a range of potential alternatives described for purpose of defining the cost and schedule range?				
Is the overall construction cost and schedule range identified for the proposed alternative?				
Is there a life-cycle cost analysis for the selected alternative?				
Are there life-cycle cost estimates for all alternatives, if cost is a significant factor in determining the selected alternative?				
Are risks and uncertainties described and qualified or quantified?				
Are costs for the next phase (preliminary design) and a funding source identified?				

Note: If the sufficiency review is unsatisfactory and improved documentation is not readily available (or if the methods and approach are questionable), the ICR may be changed to an ICE with approval of OECM Lead. See Appendix C for the ICR-ICE decision process.

Sample Reasonableness Review Summary Checklist (CD-1)

Reasonableness Review Checklist				
The reasonableness review summarizes the lines of inquiry and review of the documentation for the overall reasonableness of the estimate. Specific findings and recommendations are captured in the ICR report				
The review team members should answer the questions as noted. Provide comments as appropriate to clarify the answer. Yes is good (reasonable or acceptable); no is not.				
Questions	Y e s	N o	N / A	Comments
Documentation				
If additional documentation was requested, was it received in time to support the review?				
Is the documentation package complete and usable as a basis for the estimate?				
Relevance				
Are the approaches used in the estimate appropriate for the information available?				
Are the assumptions appropriate for the project?				
Are appropriate rationales documented for items like engineering judgment?				
Is historical information appropriately used for the estimate?				
Are the mathematical calculations correct?				
Consistency				
Are the methods used for evaluating each alternative appropriate and consistent?				
Is the estimate consistent with the technology maturity?				
Completeness				
Was an appropriate range of possible alternatives identified?				
Does the estimate (cost & schedule) include the various alternatives?				
Are funding needs and sources identified?				
Are life cycle costs evaluated for each alternative (if cost is a significant factor in the alternative selection)?				
Is the back up information (estimate basis) complete for each alternative?				
Risk and Uncertainty				
Are risks and uncertainties appropriately identified?				
Are risks and uncertainties analyzed using appropriate quantitative statistical techniques?				
Are both cost and schedule risk impacts identified?				
Reasonableness				
Is the overall cost range estimate for the recommended alternative reasonable?				
Is the overall schedule duration range estimate reasonable?				

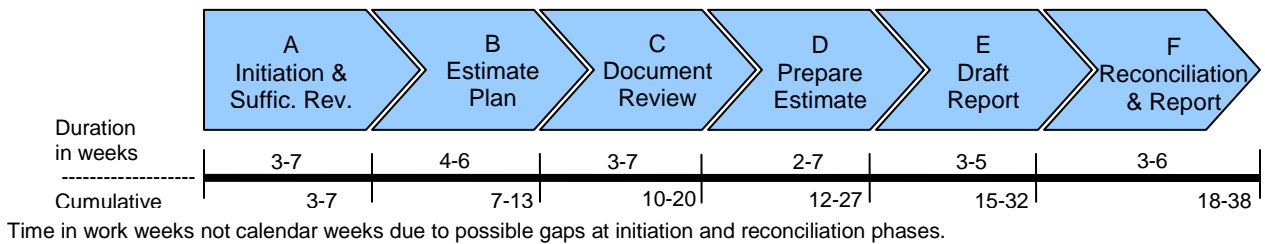
Sample Summary Form

Reasonableness Review Summary Form					
Evaluation Score	Yes		No		Major Issue Description
Appropriate Documentation Received & Usable					
Estimate Relevant					
Estimate Consistent					
Risk & Uncertainty Adequately Addressed					
Overall Estimate Reasonable					

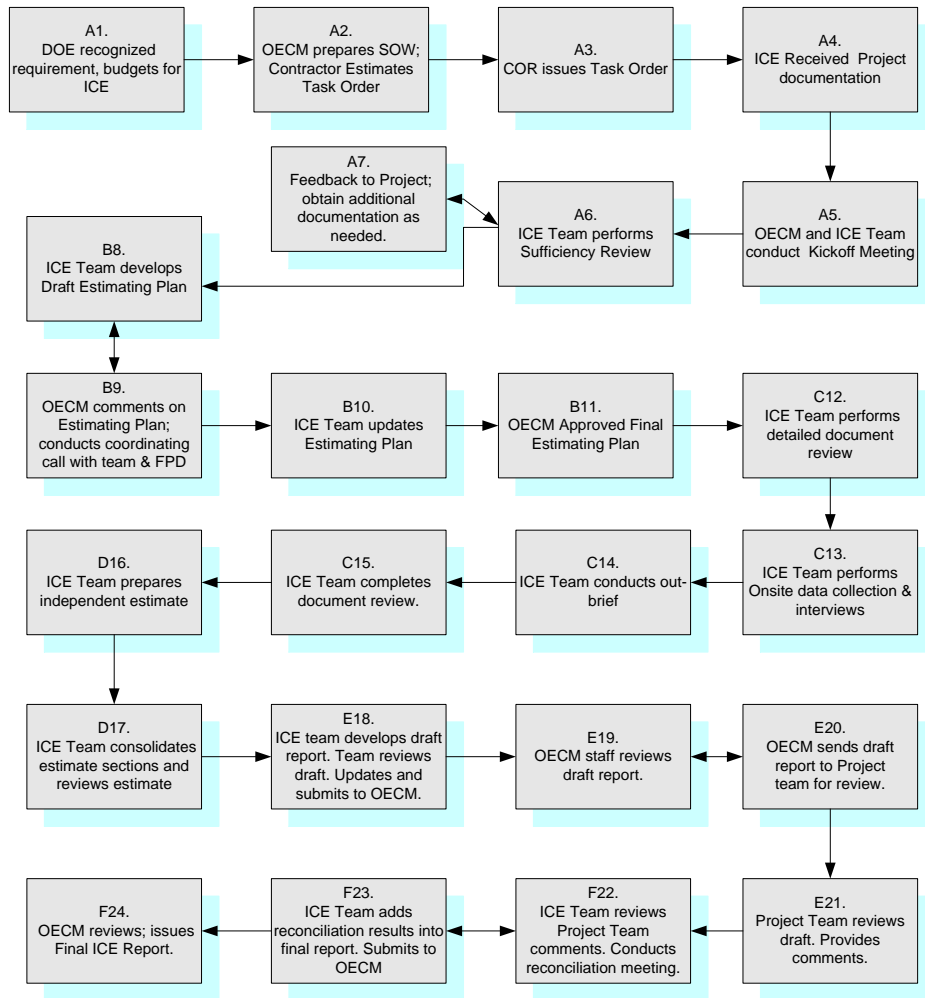
APPENDIX E ICE PROCESS

The ICE process goes from initial planning through reporting results and corrective actions. The simplified process diagram shown below highlights the overall steps. The detailed process diagram shows each sub-step. The associated table lists the steps and nominal time ranges. The time and effort should be tailored to the specific project and other factors. Use of a support contractor for an ICE is assumed in this section.

**Figure 5. Simplified ICE Process Diagram, Timeline (weeks),
and Comparison to GAO Estimating Process**



ICE Process Flow Diagram



The following table lists the process steps and provides additional information on each step, as appropriate.

ICE Process Flow Steps

Step	ICE Activity	Nominal Schedule Range (Weeks)
A	Initiation	
A1	OECM, Program Office: DOE requirement recognized, approved, and budgeted. Scoping meeting conducted with Program and Project. ICE Team needs identified.	
A2	OECM: Task SOW written, issued to contractor by COR, contractor estimates, and task negotiated with contractor, as required.	1-3 weeks
A3	OECM: Task order issued (either as separate task or as part of EIR), as required.	1-2 weeks

Step	ICE Activity	Nominal Schedule Range (Weeks)
A4	OECM: Receive initial project documentation including cost and schedule estimate and Basis of Estimate (if not already done, transmit documents to team. Preferred method of document transmittal is via posting to an electronic site provided by Project Team.	Time 0
A5	Kickoff meeting (telephone conference call) with entire ICE Team	1-2 weeks
A6	ICE Team: Perform Initial Sufficiency Review (ensures sufficient information to develop the review plan and perform the review)	1-2 weeks
A7	ICE Team-OECM: Provide feedback on sufficiency review and obtain additional documentation and agreement to proceed	1 week
B	Draft & Final Estimating Plan	
B8	ICE Team: Develop Draft Estimating Plan (include team info, work plan, schedule, LOIs-initial check list)	1 week
B9	OECM comments on draft plan; conducts coordinating call with FPD and ICE Team.	< 1 week
B10	ICE Team: Update Estimating Plan	< 1 week
B11	OECM Approves Final Estimating Plan	< 1 week
C	Documentation Review	
C12	ICE Team performs detailed documentation review – as per assignments in review plan; prepare, assemble, and transmit questions to obtain clarifying information or additional documentation. (Use ICR LOIs, Appendix M, as guidance for document review.)	1-3 weeks
C13	ICE Team: Perform on-site review – conduct interviews, obtain added info, develop open items (Use ICR LOIs as guidance for interviews to ensure completeness)	1-2 weeks
C14	ICE Team: Conduct out-brief – provide preliminary open items to project team; initial feedback on adequacy of assumptions and ground rules – if necessary, obtain additional documentation	at end of on-site
C15	ICE Team: Complete any additional documentation	<1-2 week

Step	ICE Activity	Nominal Schedule Range (Weeks)
	reviews required	
D	Prepare Estimate	
D16	ICE team prepares independent estimate sections, including independent risk analysis and life cycle cost estimate. Identifies any issues or concerns. Costs based on unconstrained funding case (best-case).	1-6 weeks
D17	ICE team consolidates sections and reviews total estimate	1 week
E	Draft Report—draft Estimate Document -- including team review; OECM review of draft	
E18	ICE Team: Develop draft report (includes entire team review of draft)	1-2 weeks
E19	OECM staff review	1 week
E20	ICE Team: Submit draft report for review by project team	at end of OECM review or after any updates needed
E21	Project team reviews draft report	1 week
F	Reconciliation & Final Report	
F22	ICE Team: Conducts reconciliation with project team; including meeting(s) and project update to cost and schedule, if needed	1-3 weeks
F23	ICE Team: Documents and incorporates reconciliation comments into draft estimate report; produces final report and submits to OECM	1 week

APPENDIX F ICE DOCUMENTATION REQUIREMENTS

The document requirements for a Type II ICE are similar to those required for an ICR. Refer to Appendix M for a complete listing of ICR documents needed at each project stage.

The documents required for an ICE are categorized according to the type of ICE to be performed (Type III, IV, or V). These are tabulated below. Note: If the ICE is being performed at CD-1, some of the documentation listed may not be available; appropriate documentation should be substituted.

Description	Type III		Type IV		Type V	
	Required	Received	Required	Received	Required	Received
All site overhead rates, G&A, and other markups	●		●		●	
Acquisition Strategy	●		●		●	
Basis of Estimate/Assumptions	●		●		●	
Complete set of construction and equipment specifications					●	
Conceptual Design Report	●		●		●	
Construction contract	●		●		●	
Construction Management Plan					●	
Construction schedule					●	
Contingency and management reserve analysis	●		●		●	
Costs to date by WBS	●		●		●	
Critical path schedule	●		●		●	
Design review comments	●		●		●	

Description	Type III		Type IV		Type V	
	Required	Received	Required	Received	Required	Received
Detailed project schedule	●		●		●	
Engineering studies	●		●		●	
Equipment list and specs	●		●		●	
Escalation rates and associated rationale and analysis	●		●		●	
Facility design descriptions	●		●		●	
Funding Profile	●		●		●	
Hazard Analysis	●		●		●	
Historical information – security issues, local construction climate					●	
Interface Analysis	●		●		●	
Life Cycle Cost Estimate	●		●		●	
Material Takeoffs (unless to be developed as part of ICE)			●		●	
Mission Need Statement	●		●		●	
Most recent detailed capital cost estimate and associated basis	●		●		●	
Piping schedules and specifications					●	
Piping and instrumentation drawings (P & IDs)	●		●		●	
Preliminary design information	●		●		●	

Description	Type III		Type IV		Type V	
	Required	Received	Required	Received	Required	Received
Process flow diagrams	•		•		•	
Procurement lists	•		•		•	
Project Data Sheets	•		•		•	
Project Execution Plan	•		•		•	
Regulatory requirements	•		•		•	
Resource loaded schedule	•		•		•	
Risk Management Plan including risk analysis results	•		•		•	
Risk register	•		•		•	
Sales tax rate	•		•		•	
Site labor rates	•		•		•	
Site productivity factors	•		•		•	
Staffing plans for project management and administration	•		•		•	
Start-up Testing and Turnover Planning documents and other operations readiness plans (as appropriate)	•		•		•	
System design descriptions	•		•		•	
Title I drawing package (half-size drawings)	•		•		•	

Description	Type III		Type IV		Type V	
	Required	Received	Required	Received	Required	Received
Title II drawing package (half-size drawings)			•		•	
Unique models/tools used to prepare most recent cost estimate	•		•		•	
Value Management/Engineering Report	•		•		•	
Vendor lists for major equipment	•		•		•	
Vendor quotes for all major equipment/material procurements	•		•		•	
Work Breakdown Structure (WBS)	•		•		•	
WBS dictionary	•		•		•	

Estimate to Complete

ICEs may be required from time to time in order to validate a project's estimate-to-complete (ETC). In this case, the document requirements are somewhat different from a conventional ICE used to establish a project's TPC, since more emphasis is put on actual costs and experience to date. Typical documents required for an ETC are:

Description	Received
Project Execution Plan (PEP)	
Performance-based incentive (PBI) award fee information/criteria	
Actual costs incurred to date	
Actual work completed to date	
Contingency remaining	
Risk management plan/risk analysis/contingency analysis	
Recent contractor monthly progress reports	
Pending costs (purchase orders and order requisitions not included in actual costs to date)	
Construction/Design drawings and specifications (e.g., civil, structural, mechanical, electrical, instrument, piping) annotated/red-lined to reflect work completed vs. work remaining.	
Master Equipment List and associated specifications	
Vendor quotations and bids on existing and outstanding procurements	
Resource loaded schedule	
Construction schedule including critical path schedule	
Current detailed cost to complete estimate prepared by contractor and funding profile	

Description	Received
Basis of estimate and assumptions	
Sales tax rate	
Current and projected staffing for project and construction management	
All labor rates	
Site general and administrative rates and overhead markups	
Productivity factors used in contractor cost estimate and rationale	
Unique security requirements that affect construction performance	
Escalation rates used	
Escalation analyses of local economy	
Work breakdown structure and dictionary	
Startup plan	
Testing plan, procedures, and status	
Operational Readiness Plan	
Worker training plans	
Other project cost (OPC) information (e.g., readiness reviews)	
Lessons learned reports	
Project Change Orders/baseline change proposal (BCP) documents	
Contractor Change Orders - Processed, Pending, In-Process and Planned	
Design Change Notices - Processed, Pending, In-Process and Planned	
Subcontract Technical Representatives (STR) commodities tracking/status reports/logs.	
Trend analyses for items that may need a BCP but have not impacted the project to date	
Contracts for all major work activities	
Previous project reviews/analysis	
Funding projections/commitments	
Request for Equitable Adjustment (REA) analysis (i.e., claims by contractors against the customer for delays impacting cost)	
Quality control requirements	
Departmental price commitments (e.g., DOE taking on the responsibility for steel and concrete price increases during a construction project)	

APPENDIX G

Combined EIR/ICE for CD-2

This appendix provides a detailed process for a combined CD-2 EIR and ICE, and references the documents and other activities required for both efforts.

Documentation Required:

The following table provides the integrated listing of documentation required for each effort. The two activities are listed separately for ease in identifying documentation required for each sub-team. The ICE documentation listed assumes a combined Type III/IV estimate effort (most likely ICE approach for CD-2). If a Type V estimate will be prepared, refer to Appendix J for additional documentation required.

Description	CD-2 EIR		CD-2 ICE	
	Required	Received	Required	Received
CD-0 Documents (e.g., Mission Need Statement, Approval of Mission Need)	•		•	
CD-1 Documents (e.g., Approval of Alternative Selection and Cost Range, Conceptual Design Report)	•		•	
Work Breakdown Structure (WBS) and WBS Dictionary	•		•	
Detailed Resource Loaded Schedule	•		•	
Summary project or milestone schedule	•			
Detailed Cost and Schedule Estimates, including Basis of Cost Estimate, Basis of Schedule Estimate, and all project-basis and assumptions	•		•	
Cost estimate backup, including vendor quotations, parametric formulas, engineering calculation, historical costs, and the like	•		•	
Critical Path and Near-Critical Path Schedules	•		•	
Program Requirements Document (or equivalent)	•			
System Functions and Requirements Document (also referred to as the "Design-to" requirements or Design Criteria)	•		•	
Results of and Responses to Project Design Reviews and Technical Independent Project Reviews	•			
Design Review Report and comments resolution	•		•	
Configuration Management processes, plans and procedures	•			

Description	CD-2 EIR		CD-2 ICE	
	Required	Received	Required	Received
Project Execution/Management Plans	•		•	
Evidence and results of constructability reviews of the design	•		•	
Preliminary Construction Execution Plan	•			
Integrated Project Team Charter (assignment letters as appropriate)	•			
Integrated Project Team recent minutes	•			
Documented Integrated Project Team Processes	•			
FPD Certification status and Integrated Project Team qualifications (resumes as appropriate)	•			
Federal and contractor organization chart and staffing plans; basis for federal staffing plans	•		•	
National Environmental Policy Act documentation identifying EIS and/or permit requirements and status	•			
Hazards Analysis Report	•		•	
DNFSB or NRC open issues; DNFSB and NRC Reports and correspondence	•			
Responses to DNFSB and NRC reports	•			
Documentation of DOE and DNFSB (or NRC) endorsement of design and operational safety basis.	•			
Start-up Testing and Turnover Planning documents and other operations readiness plans (as appropriate)	•		•	
Preliminary Safety Design Report (Hazard Category 1, 2, or 3 nuclear facilities)	•			
Preliminary Safety Validation Report (Hazard Category 1, 2, or 3 nuclear facilities)	•			
Preliminary Security Vulnerability Assessment Report	•			
National Environmental Policy Act documentation	•			
Regulatory agreement documentation (project commitments, milestones, deliverables, dates)	•			
Risk Management Plan (RMP)	•		•	
Risk Register (if separate)	•		•	
Risk Analysis Report, including probabilistic (e.g. Monte Carlo) results for both contractor and federal risks (if not contained in RMP)	•		•	
Acquisition Strategy/Acquisition Plan	•		•	

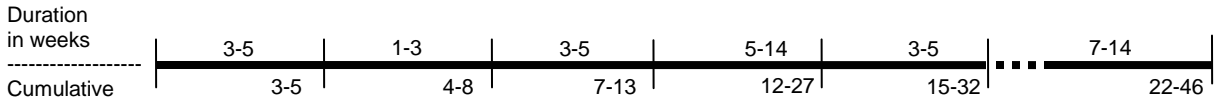
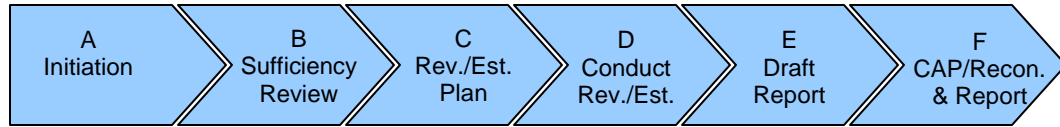
Description	CD-2 EIR		CD-2 ICE	
	Required	Received	Required	Received
Quality Control/Assurance Plan	•			
Interface Documentation (procedures, MOU/MOA with site M&O)	•			
Reports and CAPs from previous internal and external project reviews (if applicable)	•			
Project Control System description	•			
EVMS Certification Letter (or status of EVMS certification)	•			
Monthly and Quarterly Progress reports for past year; Quarterly Project Review briefings for past year	•			
Project and Contract Change Control Process	•			
Contracts applicable to the project	•		•	
Contract Management Plan	•		•	
Pending contract modifications/Requests for Equitable Adjustment	•		•	
Project Data Sheets	•		•	
Project Funding Profile (Program budget/planning office should identify if this profile is within the Program target budget profile)	•		•	
Value Management/Engineering Report	•		•	
All Baseline Change Proposal and disposition documentation and change logs				
Project Data Sheets	•		•	
Project Funding Profile (Program budget/planning office should identify if this profile is within the Program target budget profile)	•		•	
All site overhead rates, G&A, and other markups	•			
Complete set of construction and equipment specifications	•			
Contingency and management reserve analysis (if not included in Risk Analysis Report or RMP)	•		•	
Costs to date by WBS	•		•	
Engineering studies			•	
Equipment list and specs			•	
Escalation rates and associated rationale and analysis			•	

Description	CD-2 EIR		CD-2 ICE	
	Required	Received	Required	Received
Facility design descriptions			●	
Funding Profile			●	
Interface Analysis			●	
Life Cycle Cost Estimate			●	
Piping and instrumentation drawings (P & IDs)			●	
Preliminary design information			●	
Process flow diagrams			●	
Procurement lists			●	
Sales tax rate			●	
Site labor rates			●	
Site productivity factors			●	
Staffing plans for project management and administration			●	
System design descriptions	●		●	
Title I drawing package (half-size drawings)	●		●	
Unique models/tools used to prepare most recent cost estimate			●	
Vendor lists for major equipment	●		●	
Vendor quotes for all major equipment/material procurements			●	

Combined EIR/ICE Process

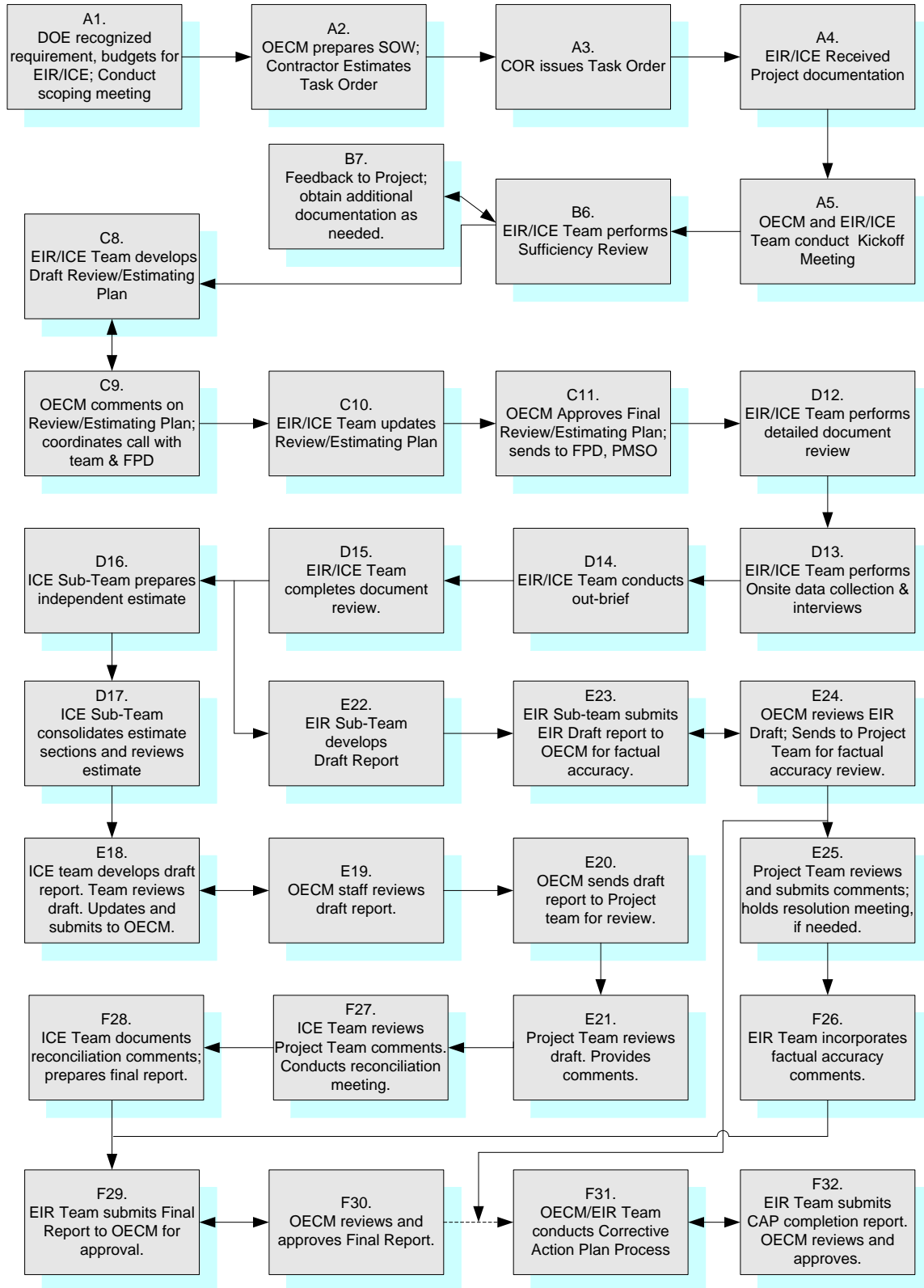
Refer to the EIR SOP for the notes for the OECM Lead in preparing and conducting an EIR. The following is the nominal combined EIR/ICE process flow diagram and detailed steps with a single contractor using the integrated process. This process should be tailored to the specific project requirements and timeline. If a separate process or dual contractors are used, the separate processes should be used.

Simplified CD-2 EIR/ICE Process Diagram and Timeline (weeks)



Time in work weeks not calendar weeks due to gaps at initiation and corrective action processes

CD-2 EIR/ICE Process Flow Diagram



EIR/ICE Process Flow Steps

Step	EIR/ICE Activity	Nominal Schedule Range (Weeks)
A	Initiation	
A1	OECM, Program Office: DOE requirement recognized, approved, and budgeted. Scoping meeting conducted with Program and Project. EIR/ICE Team needs identified.	
A2	OECM: Task SOW written—using combined SOWs from Appendices H & R, COR issues to contractor by electronic mail, contractor estimates and submits estimate with brief plan, and task negotiated with contractor, as required.	1-3 weeks after scoping meeting
A3	OECM: COR issues Task Order (either as separate task or as part of EIR), as required.	1 week
A4	OECM/EIR/ICE Team: Receive project documentation (see required documents list above) transmit documents to team. Preferred method of document transmittal is via posting to an electronic site provided by Project Team.	Note there may be a time gap until the project team delivers the required documents. Times start on receipt of documents.
A5	Kickoff meeting (telephone conference call) with entire EIR/ICE Team, OECM Lead, FPD, PM, others as needed: Discuss roadmap documents, logistics, schedules, etc.	1 week
B	Sufficiency Review	
B6	EIR ICE Team: Perform Initial Sufficiency Review (ensures sufficient information to develop the review plan and perform the review). Use guidance in Appendix N for sufficiency review checklist.	<1-3 weeks after receipt of complete documentation package
B7	EIR/ICE Team-OECM: Provide feedback on sufficiency review and obtain additional documentation and agreement to proceed	<1 week (depending on project team response for additional documentation)
C	Draft & Final Estimating Plan	
C8	EIR/ICE Team: Develop Draft Review and Estimating Plan (include team info, work plan, schedule, estimating methods, LOIs). For guidance, use G413.3-9 for EIR Review Plan; G413.3-21 for cost estimating.	2-4weeks
C9	OECM comments on draft plan; conducts coordination call with FPD, EIR/ICE Team	< 1 week
C10	EIR/ICE Team: Update Review and Estimating Plan	< 1 week
C11	OECM approves Final Estimating Plan; sends to FPD, PMSO	< 1 week

Step	EIR/ICE Activity	Nominal Schedule Range (Weeks)
D	Conduct Review/Prepare Estimate	
D12	EIR/ICE Team performs detailed documentation review – as per assignments in review/estimate plan; prepare, assemble, and transmit questions to obtain clarifying information or additional documentation. (For ICE, use ICR LOIs, Appendix F, as guidance for document review. EIR LOIs contained in EIR SOP)	1-3 weeks
D13	EIR/ICE Team: Perform on-site review – conduct interviews, obtain added info, develop open items (Use ICR LOIs as guidance for interviews to ensure completeness)	1-2 weeks
D14	EIR/ICE Team: Conduct out-brief – provide preliminary open items to project team; initial feedback on adequacy of assumptions and ground rules – if necessary, obtain additional documentation	at end of on-site
D15	EIR/ICE Team: Complete any additional documentation reviews required. (note EIR sub-team proceeds to Step E22)	<1-2 weeks
D16	ICE Sub-team prepares independent estimate sections, including independent risk analysis and life cycle cost estimate. Identifies any issues or concerns.	2-6 weeks
D17	ICE Sub-team consolidates sections and reviews total estimate	1 week
E	Draft Report—draft Estimate Document -- including team review; OEMC review of draft	Note: ICE and EIR Sub-teams are parallel efforts
E18	ICE Sub-team: Develops draft report (includes entire team review of draft). Updates for team comments. Submits to OEMC.	1-2 weeks
E19	OEMC staff: Reviews draft ICE report. Iterate with ICE Sub-team as needed to update draft report.	1 week
E20	OEMC: Sends draft ICE report for review by project team.	at end of OEMC review or after any updates needed
E21	Project team: Reviews draft ICE report. Provides comments to OEMC/ICE Sub-team. ICE Sub-team activities skip to Step F21.	1 week
E22	EIR Sub-team: Develops draft sections of EIR report including sub-team review of drafts.	1-2 weeks
E23	EIR Sub-team: Submits EIR section of draft report to OEMC for review and project team factual accuracy review.	-

Step	EIR/ICE Activity	Nominal Schedule Range (Weeks)
	Updates draft if needed from OECM review.	
E24	OECM staff: Reviews EIR draft. Iterates with sub-team if needed. Sends to project team for factual accuracy review. (Note: to expedite CAP process, the project team may choose to use the draft CAP to proceed with corrective actions. If so, proceed in parallel to step F31.	1 week
E25	Project Team: Reviews EIR draft and provides factual accuracy comments to OECM/EIR Sub-team. Requests OECM to conduct resolution meeting, if desired.	1 week
F	Reconciliation & Final Report	
F26	EIR Sub-team: Incorporates factual accuracy comments in draft report. Iterates with Project Team if required to clarify comments. Circulates revised draft to sub-team. EIR Sub-team activities continue to Step F29.	1 week
F27	ICE Sub-team: Reviews Project Team comments. Conducts reconciliation meeting (in person or conference call depending on extent of comments)	1-3 weeks
F28	ICE Sub-team: Documents reconciliation comments and incorporated into draft estimate report. Revises cost and schedule estimate if required.	1 week
F29	EIR Team: Coordinates two draft sections (ICE and EIR) into a final report. Team reviews final report. Team lead incorporates comments and submits final estimate report to OECM.	1 week
F30	OECM staff: Reviews final report. Iterates with EIR Team, if needed. OECM Lead briefs OECM management on results; approves final report. OECM lead sends Final Report to Program Office and Project team. EIR Team submits electronic files with record documentation.	1-3 weeks
F31	Corrective Action Process: Project team completes CAP for EIR findings. Updates cost and schedule if appropriate. Submits CAP for OECM/EIR Team review. OECM/EIR Team reviews CAP and provides comments. Project Team prepares documentation to implement Major Finding corrective actions and adjusts CAP, if needed. Project Team submits evidence files for Major Finding actions and revised CAP to OECM/EIR Team. EIR Team reviews evidence files and iterates with OECM/Project Team, as needed.	<p>Normally a time gap of a few weeks after final report to CAP received.</p> <p>Comment on CAP: 1 week after receipt of CAP</p> <p>Comment on evidence files: 1-2 weeks depending on extend of changes.</p>
F32	EIR Team: Drafts and internally reviews CAP Report. Submits draft to OECM; incorporates OECM comments and submits Final CAP Report. OECM approves report.	1-2 weeks

Lines of Inquiry for CD-2 EIR

These are the same as listed in the EIR SOP. The cost review portion of the LOIs will be conducted as part of the ICE on-site review. Note, the LOIs listed include CD-2 and CD-3 LOIs and should be adjusted to include only the CD-2 LOIs. The ICE team will develop specific areas to investigate and questions for the project team as part of the estimate plan.

Combined EIR/ICE Support Contractor SOW

If a combined EIR/ICE support contractor is to be used, the SOWs provided in the Appendix M should be used as guidance.

